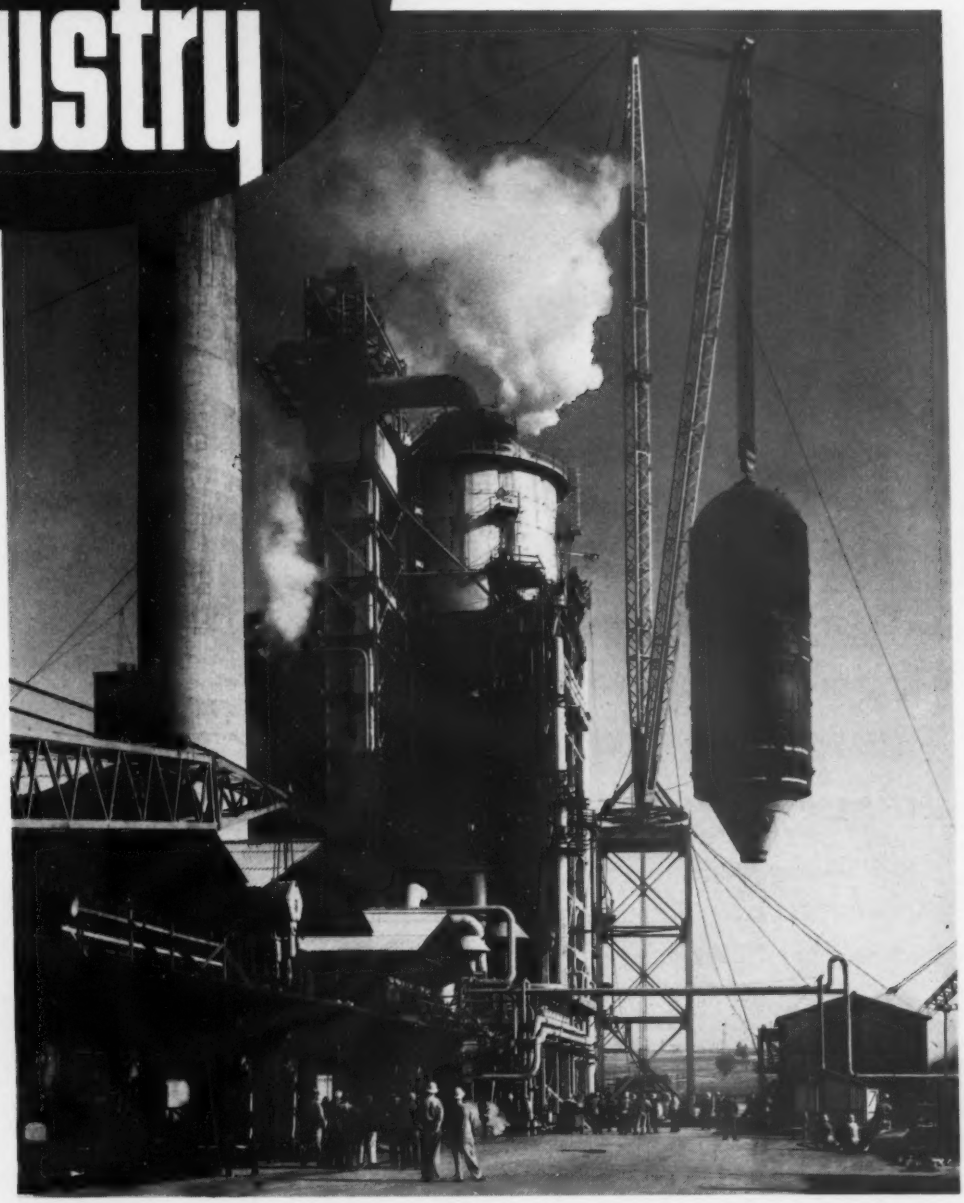
Western Industry

August 1953



Materials handling is the science that must become a part of everyone's thinking, especially in the West, where rapid industrial growth and novel conditions call for the utmost ingenuity . . .
see page 30

5th ANNUAL MATERIALS HANDLING ISSUE

You get more from CABCO

Engineering... the uniformity, dependable strength and light weight of Cabco containers are not accidental. They result from careful engineering. Thickness of slats, size of cleats, number of wires—even the spacing of the wires—all contribute importantly to the overall strength and superior protection of Cabco wirebounds. Experienced engineering is another reason why Cabco containers are the West's favorite—have been since 1883.

PRECISION-BUILT JET ENGINE PARTS ship in Cabco wirebounds, too. The mirror finish and fine-tolerance construction of Ryan Aeronautical Company afterburner exhaust cones must be jealously guarded during shipment. Cabco engineers designed a light but tough wirebound that not only gives real protection but materially reduces weight and saves crating time.

Cabco has solved many such container problems for manufacturers as well as for the West's great fruit, produce and poultry industries.

Why not ask the nearest Cabco man to check your present shipping container. His service costs you nothing, yet may save you much.

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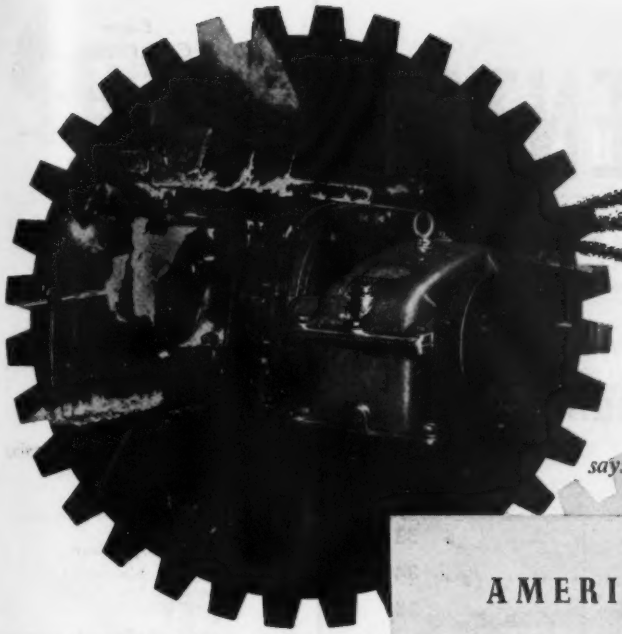

Customer report on WESTERN GEAR SPEED REDUCERS:

"We recommend their use"

says **MILO G. SPAICH,** *General Manager, American Forge Company, Niles, California*

PACIFIC-WESTERN SPEED REDUCERS *installed at the American Forge Company plant. Pacific-Western is the brand name used on products manufactured exclusively by Western Gear Works, Pacific Gear & Tool Works and South Western Gear Works.*

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SINCE 1888

NILES, CALIFORNIA • Telephone Niles 3311

JOSEPH EASTWOOD
President

May 13, 1953

Pacific Gear & Tool Works
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Attention: Mr. R. G. Bourne

Gentlemen:

We are pleased to inform you that the Pacific Western Herringbone Speed Reducer, Model No. D-50, which we purchased in 1947, has been in continuous service and has not given us any operating problems, nor have we lost any productive time because of mechanical failure on the part of your unit.

For your information, this unit was installed on our Mar-Tempering machine which is used in the heat treatment of grinding balls. The continuous operation of this piece of equipment is of utmost importance to us because any mechanical failure resulting in a shutdown will cause a substantial loss to us due to the fact that the grinding balls being heat treated will not be up to standard and would have to be scrapped.

The performance of your unit has been excellent in every respect, and we are happy to recommend its use to any industrial firm.

Very truly yours,

AMERICAN FORGE CO.

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GENERAL MANAGER

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Western Industry

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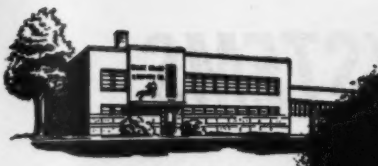

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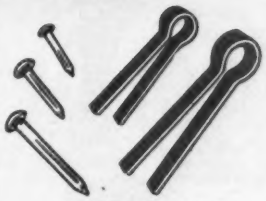

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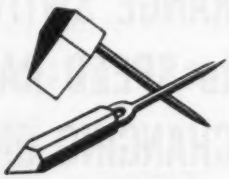

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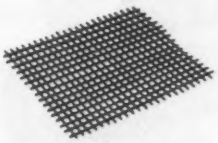

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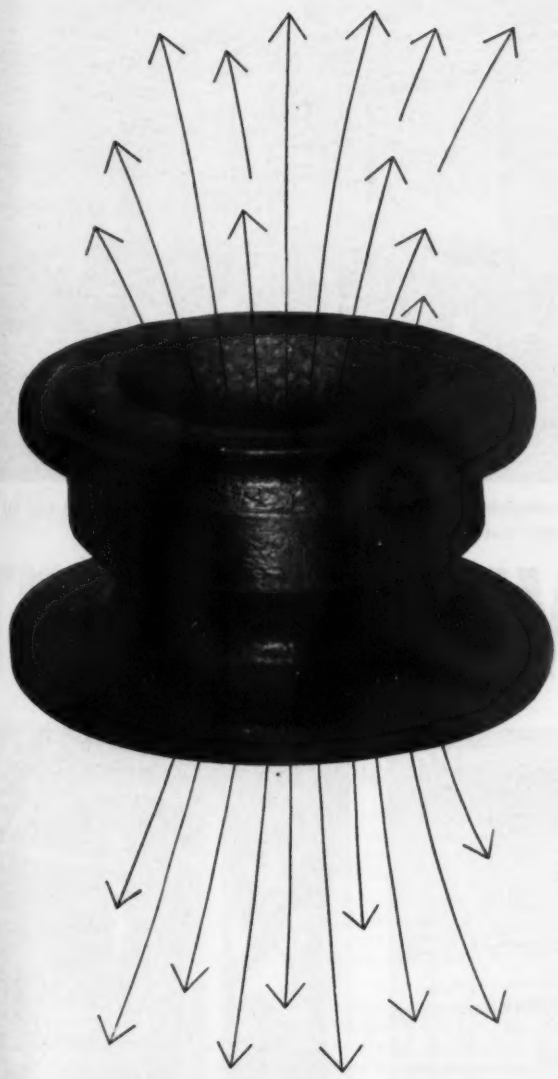

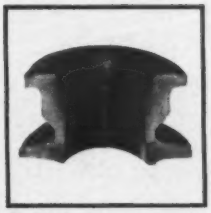

This housing for an engine starter weighed too much, cost too much, until AmForge engineers redesigned it with a hole through it.

Admittedly, this case is extreme. But it is an example of the savings that AmForge has been able to find for its customers at its Upset Plant in Chicago. West Coast manufacturers can now obtain similar benefits from AmForge's new facilities at Azusa, California. Backed by more than 50 years of forging experience, this new plant will possess every modern facility for making forgings of the high and uniform quality you demand.

For this engine starter manufacturer, AmForge saved 343 tons of steel worth $39,000. The original forging required 49 pounds of aircraft quality steel to produce a forging weighing 36½ pounds. Preparatory to final machining it had been bored and faced, a slow operation. After AmForge engineers were through with it, the metal requirement was reduced to 28 pounds, to make a forging weighing 21¼ pounds. Cost of bore and face operations were cut in half. Balance of machining time was cut 10 percent.

To discover how AmForge may help you, send a blueprint, sketch or sample for engineering study—no obligation, of course.

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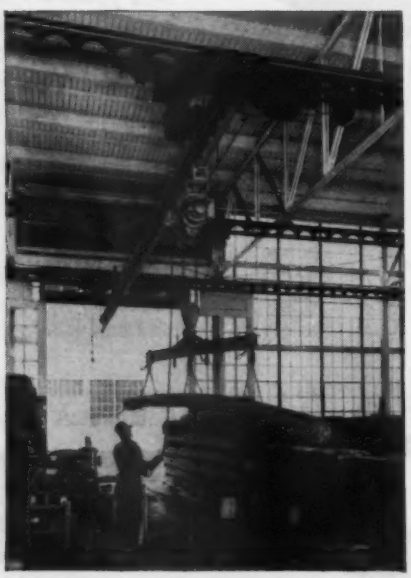
PLANTS: AZUSA, CALIFORNIA • CHICAGO, ILLINOIS

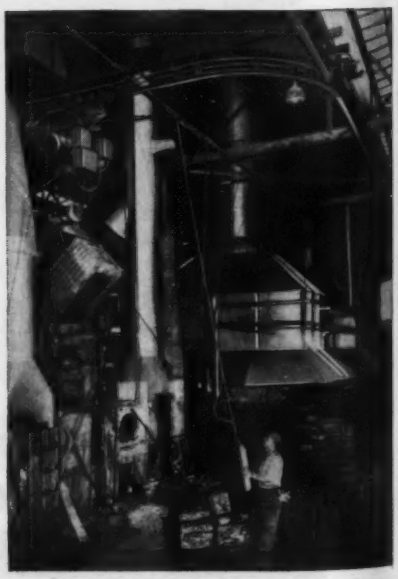
PETERSON TRACTOR AND EQUIPMENT CO., SAN LEANDRO, CALIF., is saving about 15% of time required for complete overhaul on Caterpillar equipment with four 3-ton 50 foot motorized Cleveland Tramrail cranes.

CLEVELAND TRAMRAIL SERVES

REFRIGERATION ENGINEERING, INC., LOS ANGELES, solved the problem of handling high condensers under a low roof by this special high-lift 3-ton crane. Distance floor to truss 11′ 10″. High position hoist hook 10′ 0″ above floor.



KORTICK MANUFACTURING CO., SAN FRANCISCO, saves $5000 yearly on steel purchase cost and cuts unloading time 2 hours per car with a 5-ton 50-ft. span motorized transfer crane. Shown interlocked with track extending through doorway over railroad.



FEDERATED METALS DIVISION, AMERICAN SMELTING AND REFINING COMPANY, SAN FRANCISCO, charges a melting furnace with a motor-driven Tramrail carrier. Tote boxes are hoisted and emptied by two individually operated hoists.

A LOS ANGELES WIRE MILL picks up 3500 lbs. of rod at a time with a tilting hook that can be hoisted, lowered and rotated 360° with a 76 foot crane.

THE COLD METAL PRODUCTS COMPANY CALIFORNIA, LOS ANGELES, stores more steel st in their warehouse, reaches any coil quickly and redu damage from dents to the highly finished metal by use two 6-ton motorized Tramrail cranes.

THE LOS ANGELES TIMES has been saving time for years with an overhead Cleveland Tramrail crane syste The equipment is used for handling printing rolls and pre parts when making repairs.

THE WEST . . . . .

SPEEDS PRODUCTION — SAVES FLOOR SPACE — IMPROVES SAFETY — REDUCES FLOOR CONGESTION — CUTS COSTS

From Mexico to well above the Canadian line the West is dotted with hundreds of varied installations of Cleveland Tramrail overhead materials handling equipment serving nearly every type of industry. Many of these installations have been in continuous service for over 25 years.

Cleveland Tramrail consists of track, switches, carriers, cranes, hoists, grabs, etc. which can be combined in a thousand-fold ways to exactly suit your need. As illustrated, it can be assembled into all variations from simple manually or electrically powered, floor-controlled equipment to cab-operated and automatic plant-wide systems.

You will be amazed how fast Tramrail equipment pays for itself and at the many advantages it provides. Any of the WESTERN REPRESENTATIVES LISTED BELOW will be glad to show you nearby installations. Why not make an appointment now and get first-hand information from unbiased users? No obligation, of course.

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LOCKHEED AIRCRAFT CORPORATION, BURBANK CALIF., has been handling giant aircraft and aircraf sections for many years with overhead cab-operate Tramrail cranes.

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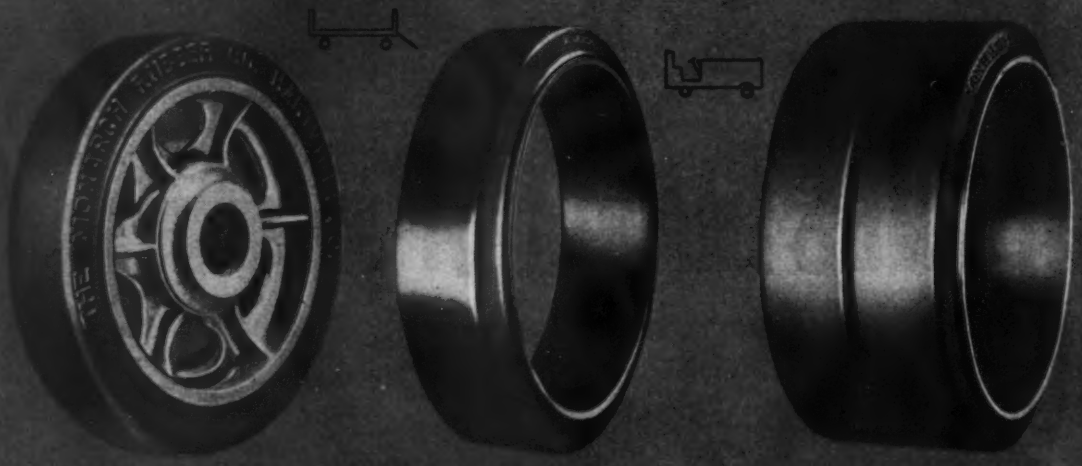

Monarch industrial tires are supplied on wheels by a majority of wheel and hand truck manufacturers.

Designed for low ton mile cost, this tire is particularly efficient on high lifts where sway is a factor.

The groove tire, used primarily on large industrial trucks and trailers, rounds out the complete Monarch line of solid industrial tires.

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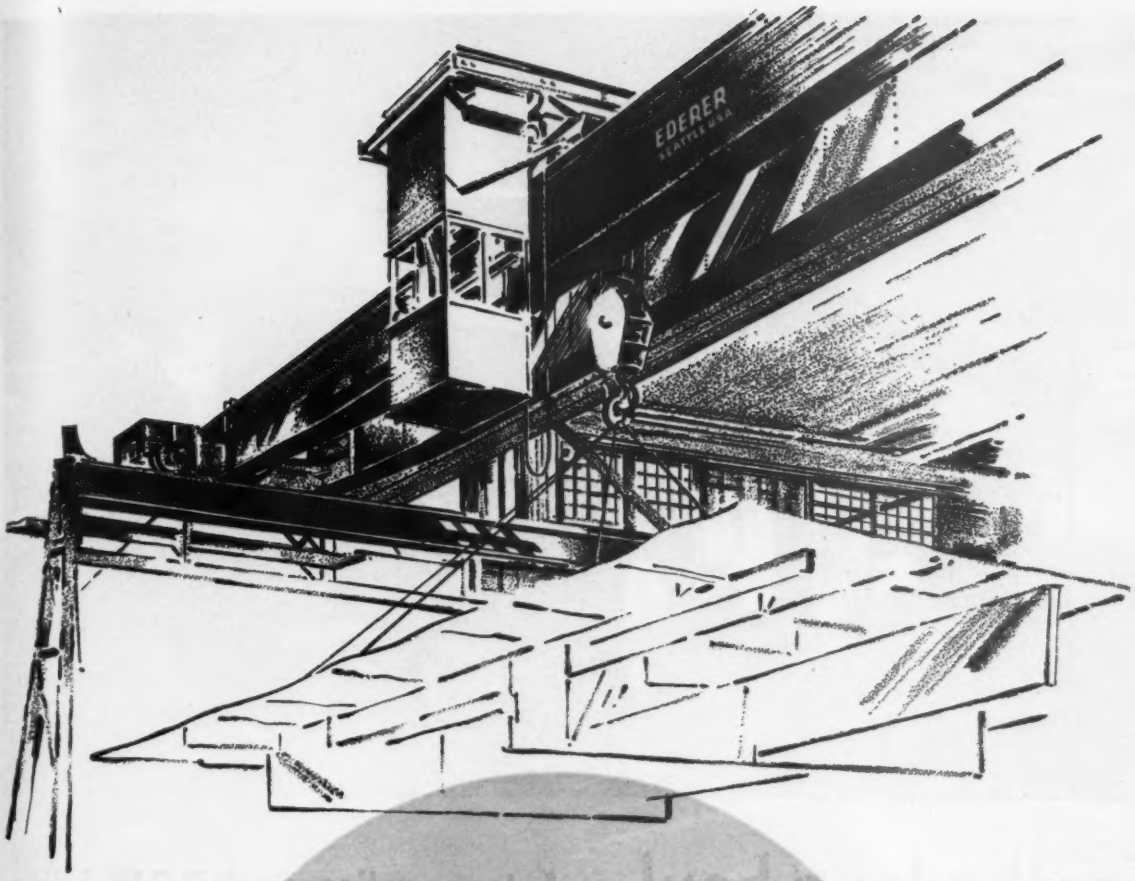

The EASY way to move heavy fabricated plate sections

This 15-ton, 80-foot EDERER crane was "job-engineered" to expedite the handling of heavy fabricated steel plate sections. The cab moves with the trolley, keeping the operator constantly "on top" of his load. EDERER's extra heavy duty construction makes for minimum maintenance, economical operation, lower cost-per-ton materials handling costs.

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CRANES

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Famous truck builder rates them best for ease of assembly and accessibility

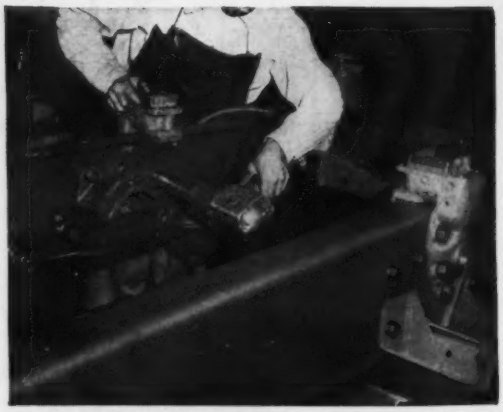
It's been a long time since the Autocar people switched from riveted to bolt-and-nut construction. Here's how it happened:

Two Autocar engineers took off on a coast-to-coast run to shake the bugs out of a new test model. Things went well until a riveted spring bracket broke. It took an entire day just to chisel through the rivets because it was hard to get at the bracket.

From that day on, it was *accessible* bolt-and-nut construction exclusively for all Autocar trucks. And Autocar standardized on RB&W bolts. One dividend from using these rugged bolts is that Autocar can specify higher-strength material than is practical for riveting. Furthermore, tests on structures like bridges show that rivets frequently loosen. This doesn't happen to bolts on Autocar frames.

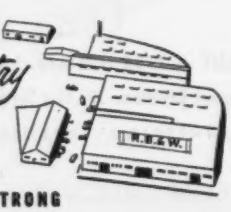
Where you want to join structural members firmly together so they'll *stay* together for good, high-strength bolting is often your best bet.

As the leading manufacturer of all kinds of fasteners, we're in the unusual position of always being able to recommend and supply the right ones for all your needs. Write to RUSSELL, BURDSALL & WARD BOLT AND NUT COMPANY.



FASTER FASTENING is achieved in the Autocar plant at Ardmore, Pa., by using air tools like the one shown here to run up RB&W nuts on RB&W bolts on an Autocar truck frame. In addition to making tight, accessible joints, bolting effects substantial assembly savings. 3,1

RB&W *serves Western industry with the complete quality line*



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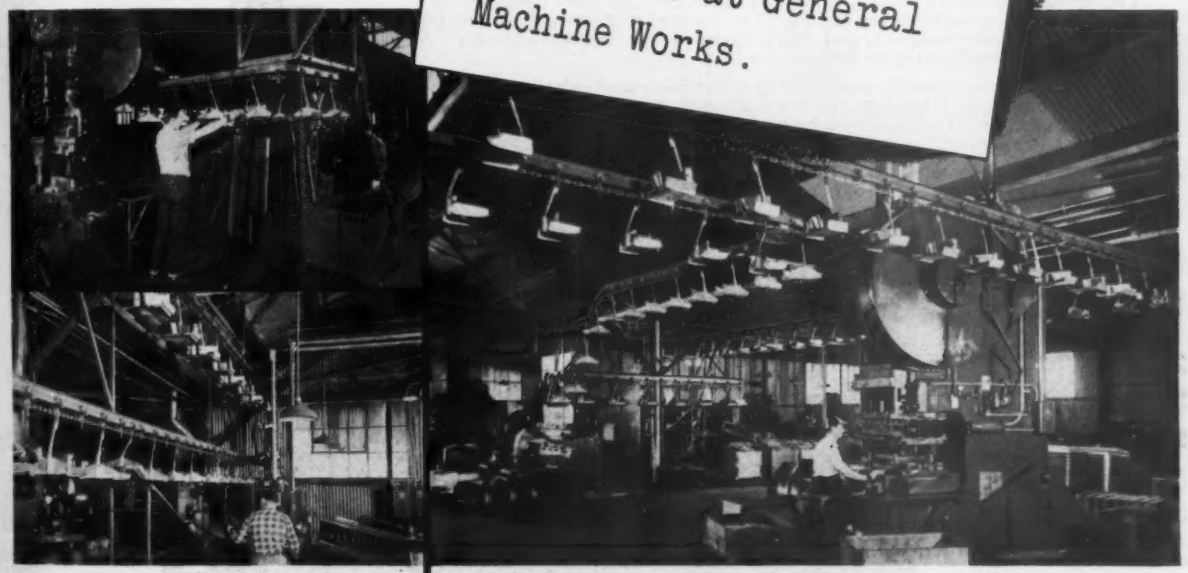
189 ft. of Webb Conveyor

LIGHTWEIGHT "JUNIOR" OVERHEAD TYPE

CASE HISTORY

Keeps 15 men producing Ford hood hinge assemblies at General Machine Works.

GENERAL MACHINE WORKS is not confined to the manufacture of just this item; by a change of carriers, the Webb overhead conveyor adapts itself to the production of other parts.



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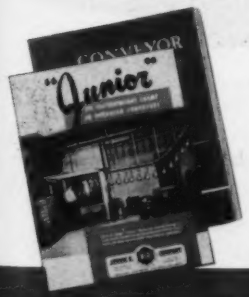

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"There is no wasted motion"

says Elmer L. Lipp, Owner, Mgr. . . .

PERFECTLY TIMED to fifteen operations in the manufacturing process, this short 189-ft. Webb Conveyor carries the stampings from press to press, automatically separates and delivers left hand and right hand parts to assemblers, riveters and packers. In the complete manufacturing process only the Webb Conveyor transports the parts. A small overhead conveyor can eliminate waste motion, save space and increase production. Get the facts; write today!

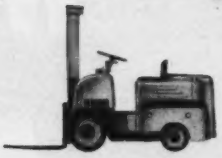
JERVIS B. WEBB
COMPANY OF CALIFORNIA

BUDA

FORK LIFT TRUCKS...

the line that out-steps them all

FPB 20-24 Pneumatic Tires
FB 20-24 Cushion Tires
2000 lb. cap. at 24" center



FT 50-24 (FTD 50-24)
5000 lb. cap. at 24" center

FT 40-24 (FTD 40-24)
4000 lb. cap. at 24" center

Here is a line of fast, powerful, modern Fork Lift Trucks that, feature for feature, outsteps them all. Buda Trucks meet the universal demand for motorized materials movers capable of handling more ton capacity per day at lowest cost.

Engineered into these compact, streamlined Fork Lift Trucks are pace-setting design, operating and performance features. These trucks give you big shouldered, brutal power, workhorse capacity and ease of operation that results in greater material handling ability at surprisingly low cost.

And these fast-steppers are powered by either Buda-built extra heavy duty Diesel or gasoline engines that outlast other engines by thousands of hours. What's more, Buda offers Torque Converter for "cat-life" clutch service and gentle "inching and stepping."

Ask the man charged with your materials handling responsibility to write for complete details and performance data on Buda . . . the line that outsteps them all.

The Buda Company, Harvey, Illinois

Western Sales and Service:

Arizona Equipment Sales Co.
Phoenix, Arizona

Buda Engine & Equipment Co., Inc.
Seattle 4, Washington

Buda Engine & Equipment Co., Inc.
Portland, Oregon

Joe Coursey Equipment Co.
Denver Colorado

The Long Company
Salt Lake City 9, Utah

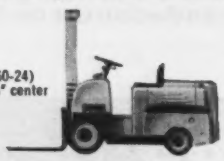
Roll-Rite Corporation
Oakland 7, California

Motor Power Equipment Co.
Billings, Montana

Air-Mac, Inc.
Los Angeles, Calif.

FT 30-24 (FTD 30-24)
3000 lb. cap. at 24" center

Powered by Buda Industrial Type Diesel or Gasoline engines . . . available with Torque Converter for maximum performance

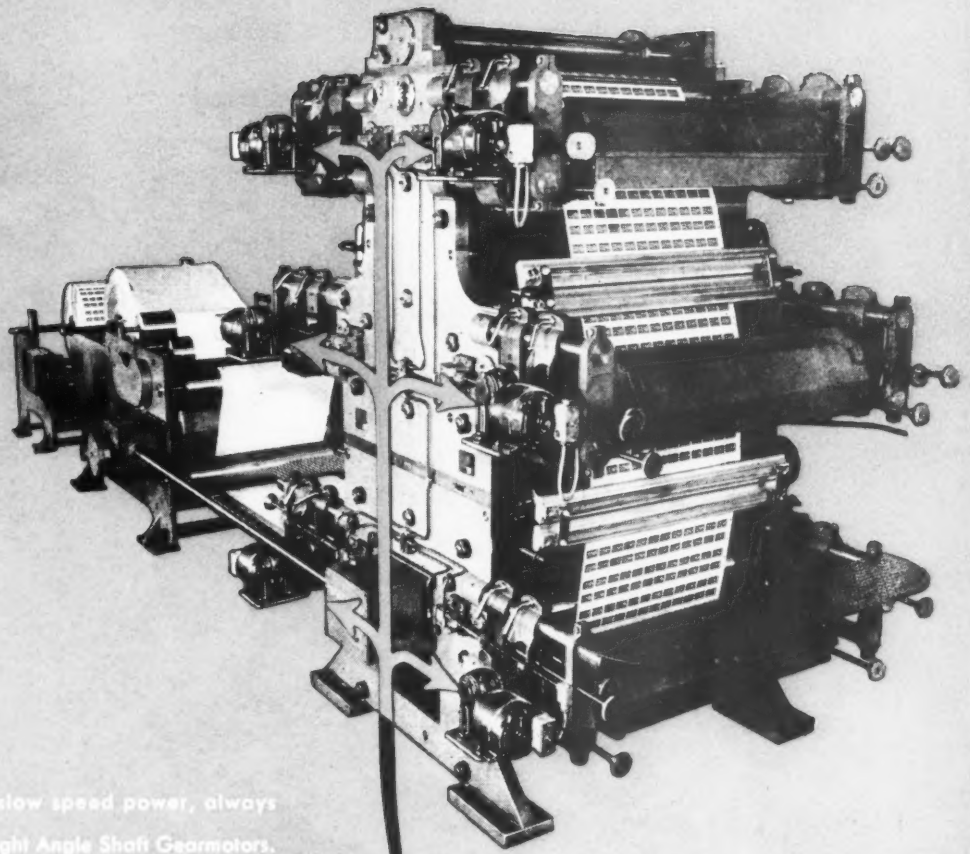


FT 60-24 (FTD 60-24)
6000 lb. cap. at 24" center

BUDA

building dependable products since 1881

FT 75-24 (FTD 75-24)
7500 lb. cap. at 24" center

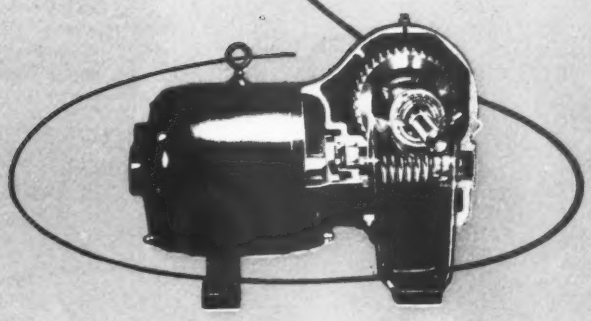


When you must have slow speed power, always consider first MASTER Right Angle Shaft Gearmotors. They're very compact . . . low in cost . . . safe . . . and so easy to use.

And nowhere else can you get anywhere near the wide range of selection that you have in MASTER Right Angle Gearmotors. They're available in sizes ¼ to 25 Horsepower for all electrical specifications and in splash-proof, enclosed or explosion-proof construction. Gear reduction ranges up to 430 to 1 with the countershaft in either horizontal or vertical positions. In addition these gearmotors can be supplied with integrally built electric brakes . . . three types of variable speed units . . . and with fluid drive units for cushioned power.

Try them . . . you'll find they're the horsesense way to get slow speed horsepower.

you can't beat them for compact slo-speed power



THE MASTER ELECTRIC COMPANY
DAYTON 1, OHIO

WESTERN BRANCHES

SALT LAKE CITY PORTLAND SPOKANE SEATTLE LOS ANGELES SAN FRANCISC

Thousands of AnacondA Potheads—like the one in center of this specially posed photograph—are available from relatively few, readily-interchangeable components. A wider variety than ever before—yet stockroom parts inventory is actually less. To fill *all* your pothead specifications, you need fewer parts.

A neater and better job can be obtained by using an AnacondA Jointing Kit. These unit packages of jointing materials contain all necessary materials to make one complete joint on a specific size and type of cable. An AnacondA Jointing Kit eliminates the possibility of inadequate materials . . . cuts down the need for large stocks.

Greater stability of AnacondA Insulating Compounds is based on extensive research for balanced compositions with proper physical and electrical characteristics for any installation.

ANACONDA CABLE ACCESSORIES

Service is better than ever on this complete line, designed by power-cable specialists for use with any make of cable. Expanded facilities keep pace with trend toward ordering cable and cable accessories together.

Anaconda's 20-year-old Cable Accessories Department is busier now than ever. In new and expanded quarters it is turning out greatly increased quantities of potheads, jointing kits, insulating compounds and paints. Back of this activity lies a story of increased demand by utilities, railroads, industrials, and equipment manufacturers for cable accessories that are engineered by power-cable specialists. Here, old and new customers have found the consistent quality, good engineering, ease of installation and low cost of maintenance traditional with Anaconda for years.

ANACONDA Potheads spearhead the line. Available in such types as capnut, switchgear, transformer, disconnect, and through types, they feature an interchangeability of parts equalled nowhere else.

More than 2000 different pothead assemblies can be furnished from standard parts for any particular conductor size and voltage rating in the multi-conductor capnut type alone!

Another popular item is the ANACONDA Unit Package of Jointing Material. In one package (see illustration) is everything needed to make a complete joint on a specific size and type of cable. The kit saves time, simplifies ordering, minimizes the need for storeroom stocks, and helps assure installation of a joint engineered for the particular application.

To keep pace with the increasing demand for ANACONDA Accessories, it has been necessary again to greatly increase the facilities of the Cable Accessories Department. This Department is now in a position to promise prompt shipment on most of your orders. Call your Anaconda Representative. He is always ready to help you with your cable and accessories problems. 52460

Accessories for all types and sizes of bare and insulated conductors.

ANACONDA®

ANACONDA ON THE PACIFIC COAST: Plant at: Orange, Calif. District Offices at: Los Angeles, Calif.; San Francisco, Calif.; Seattle, Wash.

Anaconda Wire & Cable Company, 25 Broadway, New York 4, N. Y.

Gentlemen:
I'm interested in AnacondA Cable Accessories.

- ☐ Have your representative call.
- ☐ Send me your 100-page Pothead and Terminal Catalog.
- ☐ Send me your Jointing Material Catalog.
- ☐ Send me *complete* Cable Accessories Catalog.

NAME .....

COMPANY .....

TITLE .....

ADDRESS .....

CITY ..... STATE .....

Western Industry

EDITORIALS

We Grow Fast

A DOZEN years ago we never would have dreamed of being so important!

Southern California is described as "the nation's airframe production capital" in the protest made by the Los Angeles Chamber of Commerce against Southern California being left out of the picture as a result of the cutback in the Air Force heavy press program.

The area originally was scheduled to have one 25,000-ton and one 20,000-ton forging press and one 12,000-ton extrusion press. Four presses are still reported to be scheduled for installation in Cleveland, Ohio, and North Grafton, Mass., and the Los Angeles Chamber says that "whatever values are created by the program will be applied more efficiently to the aircraft industry if the forging presses are located in close proximity to the airframe capital."

Some good arguments are set forth in the protest, which says locating the presses in the Los Angeles area is sound because:

"1. Of the savings in transportation charges on carrying large forgings across the country.

"2. Of the opportunity for airframe company engineers and production people to consult more readily with press operators.

"3. Lower operating costs and relatively lower construction costs prevail here.

"4. Southern California is the center of research and development in aeronautics and aerodynamics as well as aircraft design. The Air Force operations at Edwards Air Base are, of course, related to much of this activity."

If the program isn't re-examined and we lose those presses, it will be in order to shed a few tears. On the other hand, we could re-examine our own position and be grateful that the West has arrived at the point where it can put forth the argument that it includes "the nation's airframe production capital."

It's Sensible to Be Sensible

UNIONS could have done their cause more good if they had supported, instead of opposed, Oregon's new law barring organizational picketing by unions not certified as representing employees at the company being picketed. The law, passed by the Oregon legislature, was recently signed by Governor Patterson.

The more that picketing is restricted to its legitimate purpose, the more effective it will be and the more respect and sympathy it will command from the public. As we see it, this purpose is to let the public know of legitimate grievances that the employees of a company have against its management. When unions stick to justifiable points in their opposition to national and state legislation, their prestige grows; when they oppose anything and everything, the opposite is true. Of course, the same logic applies to management.

No Walls to Crack

THE CRACKS in the Kremlin will have resulted from internal pressures, not exterior. Cracks in the Chinese wall will come about the same way. In both cases the cause will be the demand for a better way of living.

With us the same motivating power is dominant, but we have no walls to be cracked, because our system of government is an agreement on methods of helping the individual to attain progress, rather than a means of compressing him into a mold designed by a centralized authority.

We need not fear that tapering off in military requirements will disrupt the industrial economy of the West. Some of our efforts may have to be directed into new channels, but as the West, more than any other part of the country, is an expression of the urge for a better way of living, its requirements for goods and services will continue to increase, rather than decrease.

Hyster 20 with Load-Grab and rubber-faced arms picks up two bales of burlap bags. No pallets are required.

Approaching truck with bales, Hyster 20 takes bags *directly into* truck and neatly stacks them in place.

Hyster 20 double decks a 1,430 lb. load inside a box car. Easy maneuverability, short turning radius permit placing load correctly, without further handling.

Leading Bag Manufacturers INCREASE PROFIT with HYSTER Lift Trucks

Using the *right* lift truck and attachments, a leading West Coast bag manufacturer is reducing materials handling costs every day—*by as much as* 75%. Bales are handled with the speed and efficiency of a pallet operation—*without the use of pallets!* The Hyster Load-Grab attachment grasps the bales *by the sides* for fast handling. When pallet operation is desired, Load-Grab arms and fork arms are interchanged in minutes.

The Hyster 20 is again proving its ability to speed loading and unloading jobs in close quarters. The Hyster 20 can enter easily into box cars (or trucks) with a load—and deposit load in place without rehandling.

There are other important reasons why the Hyster 20 is increasing the profits of manufacturers in the West. Your Hyster Dealer is in touch with the latest materials handling practices in scores of industries. He can recommend the latest money-saving procedures for your operation. You will be sure of getting the right truck and attachment—for Hyster offers the most complete line of industrial trucks on the market plus over 100 attachments. Call your Hyster Dealer and profit by his experience or, write to any address below:

HYSTER SALES COMPANY
2105 S. E. 7th Ave.
Portland 8, Oregon
Fillmore 6471

HYSTER COMPANY
753 9th Ave. North
Seattle 9, Wash.
Elliott 2401

HYSTER COMPANY
4445 3rd Street
San Francisco 24, Calif.
Mission 8-0680

HYSTER COMPANY
5301 Pacific Blvd.
Huntington Park, Calif.
LOgan 3291

THERE'S PROFIT IN HYSTER POWER

HYSTER

Be Sure to Call HYSTER Before You Buy ANY Lift Truck!

YOU PROFIT MANY WAYS WITH AMERICAN BLOWER AIR HANDLING PRODUCTS

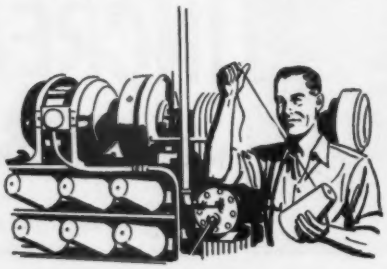
Want to step up efficiency in your power plant? Need a clean, dust-free atmosphere for process work? Do you have power transmission problems? Read how American Blower equipment can help you.

CAPITOL COMFORT

All of us can feel a bit prouder now that our most famous of buildings, the U.S. Capitol, has been renovated. The job also included the power plant where modern new American Blower Mechanical Draft Fans replaced the obsolete equipment. High static efficiency, low RPM, low tip speed and low inlet velocity are but a few of the many reasons these fans enjoy such wide acceptance. Our conveniently located branch offices, staffed with competent engineers, will be glad to furnish you with specific data.

CLEAN AIR

Soap manufacturers strive continually to achieve high standards of purity in their products. But industrial dusts raise hob at various stages of processing. American Blower equipment has helped several soap companies overcome this problem. American Blower fans and air washers, for example, are highly effective. The fan supplies an ample supply of circulating air. The air washer cleanses, purifies and freshens the air while removing dust and water-soluble odors.

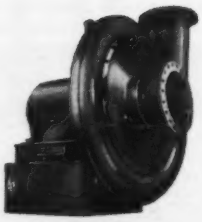


YARN ABOUT YARN

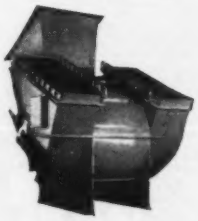
A textile manufacturer was continually changing pulleys or setting the machine rate on his ring-spinning frames to fit the material that worked at the lowest speed. He'd heard about American Blower Gyrol Fluid Drives and decided to try them. Results were amazing. Gyrol Fluid Drive permitted a higher output within safe limits of the material, allowed spinning frames to start gradually with less yarn breakage. For your business, wouldn't smooth power transmission and adjustable speed control be a distinct advantage?

YOUR BUSINESS

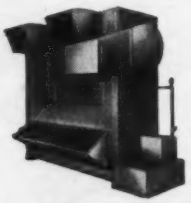
If your needs call for heating, cooling, drying, air conditioning, or air handling equipment, you'll find American Blower an excellent source of supply. For data, phone our nearest branch office.



Centrifugal Compressors



Mechanical Draft Fans



Air Conditioning Equipment

Gyrol Fluid Drives

Utility Sets

AMERICAN BLOWER CORPORATION, DETROIT 32, MICHIGAN
WEST COAST PLANT: SAN LEANDRO, CALIFORNIA
Division of AMERICAN RADIATOR & Standard Sanitary CORPORATION

YOUR BEST BUY AMERICAN BLOWER AIR HANDLING EQUIPMENT

Serving home and industry: AMERICAN-STANDARD • AMERICAN BLOWER • CHURCH SEATS & WALL TILE • DETROIT CONTROLS • KEWANEE BOILERS • ROSS EXCHANGERS

If...the average Lyon Steel Equipment Dealer dressed to represent every kind of customer he serves—he'd be wearing quite an outfit!

for Lyon makes over 1500 different items—serving hundreds of markets including factories, shops, offices, warehouses, schools, churches, hospitals, clubs, institutions and homes.* (A very few typical Lyon Products are shown below.)

**Facilities also available for special contract work*

LYON METAL PRODUCTS, INCORPORATED

LOS ANGELES	SAN FRANCISCO	PORTLAND	SEATTLE	SPOKANE
3650 Union Pacific Ave.	607 Market Street	P. O. Box 3797	1755 Utah Avenue	614 Peyton Bldg.

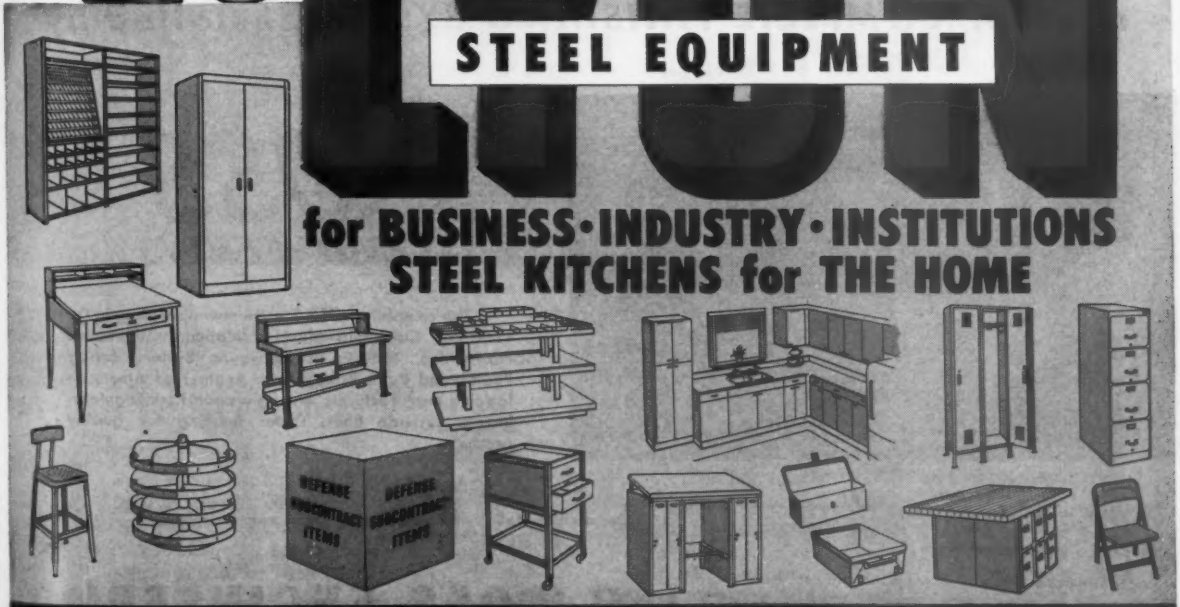
Shipment from Pacific Coast Points

General Offices and Main Factory: 840 Monroe Avenue, Aurora, Illinois

LYON®

STEEL EQUIPMENT

for BUSINESS·INDUSTRY·INSTITUTIONS
STEEL KITCHENS for THE HOME



A PARTIAL LIST OF LYON STANDARD PRODUCTS

• Shelving	• Kitchen Cabinets	• Tool Toters	• Economy Locker Racks	• Display Equipment	• Filing Cabinets	• Service Carts	• Tool Stands
• Lockers	• Cabinet Benches	• Bar Racks	• New Freedom Kitchens	• Flat Drawer Files	• Folding Chairs	• Sorting Files	• Shop Boxes
• Stools	• Storage Cabinets	• Tool Boxes	• Toolroom Equipment	• Revolving Bins	• Work Benches	• Drawer Units	• Tool Trays
• Bin Units	• Drawing Tables	• Parts Cases	• Wood Working Benches	• Hanging Cabinets	• Bench Drawers	• Hopper Bins	• Shop Desk

LETTERS

Contributions to this column from our readers are welcome. Names will be withheld from publication if so requested. Unsigned letters, however, will be disregarded.

"A rose by any other name . . ."

Editor, *Western Industry:*

The "Editors on the Move" column in the July issue (page 68) gave me a terrific kick—that part about the press conference.

My guess is that no professional publicity man was involved. Am I right?

Another guess is that the conference was arranged (probability in the order named) by:

An "inside" advertising manager, "publicity director," or "Director of Public Relations."

An advertising agency account executive.

The president's "poop boy" sales manager.

The company's legal genius.

The president's college boy nephew, who was working part time for "experience."

Frankly, it smells typically like any publicity press conference arranged either by an "inside" advertising man or an advertising account executive.

(Name withheld)
Public Relations—Publicity

The West On Its Way

Editor, *Western Industry:*

We are very much interested in receiving 100 reprints of the article by Dr. John D. Garwood entitled " 'Go Get 'Em' Policy Brings Industries to Colorado," which appeared on page 42 of the June issue of *Western Industry*. We would like to distribute these reprints to our local offices as an example of effective community action.

L. H. BATES, Commissioner
By Peter R. Giovine
Informational Representative,
State of Washington,
Employment Security Department,
Olympia, Washington

Editor, *Western Industry:*

Our sincere thanks to the author and to your magazine for your splendid publicity on the Pikes Peak Region industrial procurement program. If we can cooperate with you at any time in the future on similar projects, please feel free to call on us.

CLAYTON J. BANTA
Director, Conventions—Publicity
The Colorado Springs Chamber of Commerce, Colo.

Editor, *Western Industry:*

Many thanks for sending us a tearsheet of the article on *Atomic Power Reports* from your June issue. We were quite interested in the treatment which you gave this information. As a matter of fact, these reports have stimulated a great deal of interest and imagination. If possible, we would appreciate receiving 4 or 5 additional tearsheets of your article, or better yet, 5 or 6 complete copies of your June issue.

If we can be of assistance to you in locating additional technological information developed in the atomic energy program which might be of interest to your readers, please feel free to call on us.

DELBERT L. RUCKER
Industrial Information Branch,
U. S. Atomic Energy Commission,
Washington 25, D. C.

For NATIONAL AUTOMOTIVE FIBRES Inc.

another COMPLETE FINISHING SYSTEM installed by

ROSS ENGINEERING

The complete ROSS System now operating in the Oakland, California plant of National Automotive Fibres, Inc. consists of Conveyor System, Spray Booths and Paint Bake Oven. Another of America's leading manufacturers who rely upon Ross Engineering to provide finer, faster finishing for quality products.

View of ROSS Paint Bake Oven. Conveyor system is arranged to accommodate spray booths and oven plus an assembly area for automobile seat frames.

See our Catalog in Sweet's Engineering File or write for copy.

J. O. ROSS ENGINEERING CORPORATION
MANUFACTURERS OF AIR PROCESSING SYSTEMS

600 ST. PAUL AVE., LOS ANGELES 823 SKINNER BLDG., SEATTLE

STANDARD ENGINEER'S REPORT

DATA

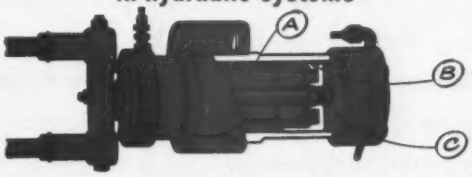
LUBRICANT	Calol O.C. Turbine Oil
APPLICATION	Hydraulic medium
UNIT	Control on hydraulic grinder Landis type C—36 in. wheel
SERVICE	Crankshaft and cylinder grinding
FIRM	Crankshaft Co, Los Angeles

Inhibited oil saves $1000 per year in "down time"!

CALOL O.C. TURBINE OIL–15 has operated the hydraulic feed on this heavy-duty grinder for 5 years without the formation of any sludge or corrosion in the system. With the oil used previously, it was necessary to make a complete system clean-up twice a year at a cost each time of about $500 in labor and work-hours lost. The filter and pump (right) are checked and cleaned every 6 months. Only leakage make-up was added during the five years to the original charge of Calol O.C. Turbine Oil.

CRANKSHAFT CO., owned by Mr. A. W. Alexander (above), specializes in precision grinding, makes many of the shafts used by top racing drivers. Mr. Alexander says, "By keeping the feed control on my machine working smoothly, Calol O.C. Turbine Oil helps us to turn out finer work."

How Calol O.C. Turbine Oil cuts costs in hydraulic systems



Used as the hydraulic medium in feeds and lifts of any kind, Calol O.C. Turbine Oil will not form carbon or foam excessively.

A. Contains very effective oxidation inhibitor—will not deteriorate and plug lines and retard action of cylinders.

B. Corrosion inhibitor prevents rusting and pitting—has high metal-wetting ability.

C. Separates readily from water or other contaminants—dirty oil may be reclaimed easily...charge lasts indefinitely; leakage only cause for replacement.

FREE CATALOG: "How to Save Money on Equipment Operation," a new booklet full of valuable information, is ready for you. Write or ask for your free copy today.

CALOL

TRADEMARK "CALOL" REG. U.S. PAT. OFF.

STANDARD TECHNICAL SERVICE checked this product performance. If you have a lubrication or fuel problem your Standard Fuel and Lubricant Engineer or Representative will give you expert help; or write Standard of California, 225 Bush St., San Francisco.

STANDARD OIL COMPANY OF CALIFORNIA

DELIVERY COSTS DROP

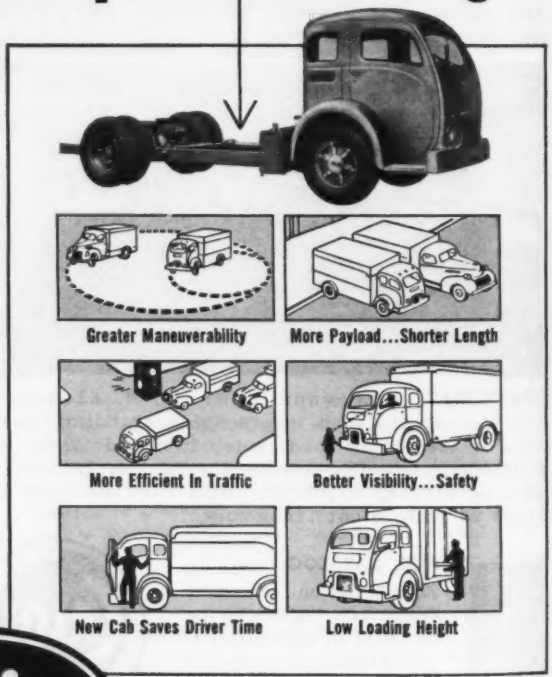
with

WHITE 3000's Drop-Frame Design!

One step from cab to street greatly reduces driver fatigue. "Knee-to-eye" case levels save reaching and stretching.

Throughout the bottling industry, substantial savings in delivery costs, in time per delivery, in loading and unloading time are resulting from the White 3000 specially-designed low frame. At the same time, driver morale and efficiency have shown marked increases.

It's an entirely new idea—the White 3000—extending cost-saving, assembly line economies into the delivery operation. Your local White Representative has the facts; ask him how this new White 3000 can increase *your* delivery efficiency NOW!



THE WHITE MOTOR COMPANY
CLEVELAND 1, OHIO
Factory Branches, Distributors and Dealers Everywhere

White 3000

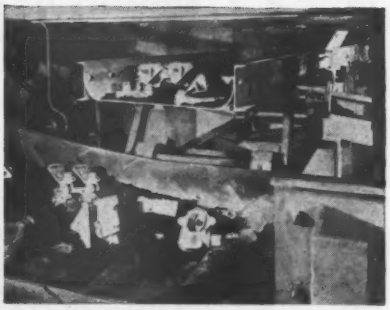
Tips its cab to service

FOR MORE THAN 50 YEARS THE GREATEST NAME IN TRUCKS

LINK-BELT engineering experience...

Overhead Trolley Conveyors permit straightline production regardless of physical layout—save time and space.

Bulk-Flo feeds—conveys—elevates a variety of free-flowing materials in horizontal, inclined and vertical directions.

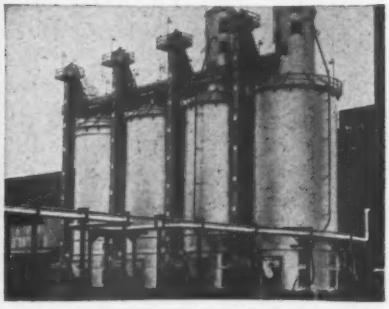


Oscillating Conveyors are ideal for handling hot, abrasive, fine, lumpy, oily materials; also for cooling, drying.

Plus LINK-BELT quality components...

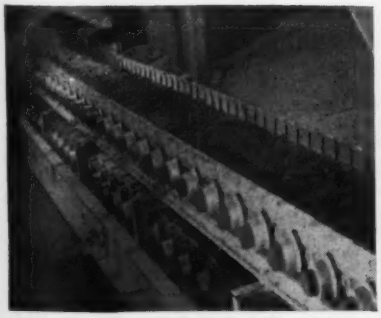
Belt Conveyors provide high capacity and low cost handling of bulk materials. Made in types and sizes to meet every need.

Screw Conveyors are simple, compact, economical. They have proved their advantages in handling bulk materials.

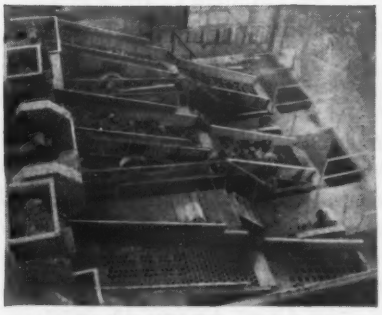


Bucket Elevators are available in a wide range of types and sizes for handling a variety of materials.

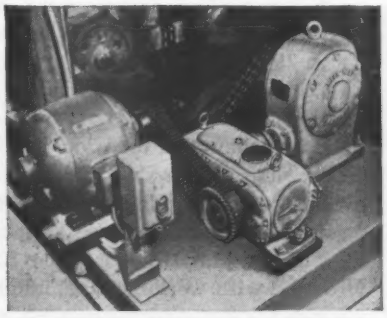
combine to cut your handling costs



Conveyors and Feeders of the apron, slat, flight and chain types are available for handling bulk or packaged materials.



Vibrating Screens. Positive-action, long-life Link-Belt Screens assure accurate sizing for wet or dry materials.



Power Transmission Drives. Link-Belt makes a complete line of chain, gear, fluid and variable speed drives for every need.

FOR the finest in modern conveying, processing and power transmission machinery, call in a Link-Belt engineer while you're still in the planning stage.

The Link-Belt quality line is backed by industry's broadest materials handling and power transmission experience. Our engineers will be glad to work with you or your consultants—help you come up with the right equipment for your requirements. Catalogs on any Link-Belt product will be sent on request.

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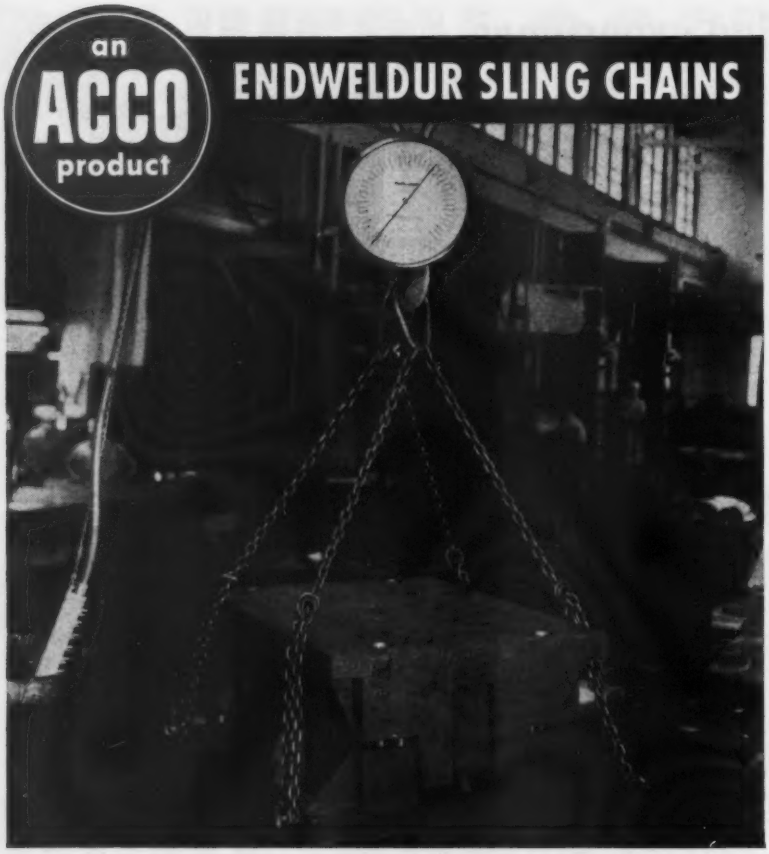

Small AMERICAN Sling Chain Lifts 25,000-lb Load Safely

• This ACCO *Registered* 4-leg, Endweldur 125 Sling Chain is relatively light in weight yet it has sufficient strength to lift an expensive 25,000-lb die with safety.

This desirable combination of great strength and light weight is the result of scientific heat-treatment of the alloy steel used in this modern chain and the proper combination of engineered hooks and pear shaped links that make up a complete ACCO *Registered* Sling Chain assembly. This gives you a chain that is easy to handle and safe to use even where working temperatures run up to 1000°F.

Endweldur 125 ACCALLOY Sling Chains come in sizes from ¼" to 1¼" with working load limits to 57,500 lbs per leg, so there is a size for just about every lift you have. Other AMERICAN Sling Chains are available in Endweldur 85 made of carbon steel, heat-treated . . . also stainless steel, monel metal and silicon bronze . . . and wrought iron.

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American Chain

CALENDAR OF MEETINGS

AUG. 24-28—*First Western X-ray Diffraction School* at Sir Francis Drake Hotel, San Francisco. Contact North American Philips Co., Inc., 750 S. Fulton Ave., Mt. Vernon, New York, sponsor.

SEPT. 9-11—*Pacific Coast Gas Association*, at the Fairmont Hotel in San Francisco. Contact Cliff Johnstone, secretary, 447 Sutter St., San Francisco.

SEPT. 9-11—*Conference on Nuclear Engineering*, University of California, Berkeley. Presented by engineering depts. of Berkeley and Los Angeles campuses. Contact: R. A. Fayram, 208 Mechanics Bldg., University of California, Berkeley.

SEPT. 10-12—*Rocky Mountain Industrial Exposition*, Univ. of Denver Arena. Contact Harold S. Craig, exec. secretary Rocky Mt. Management Club, 1031 - 15th St., Denver.

SEPT. 13-16—*American Institute of Chemical Engineers*, national convention at the Fairmont and Mark Hopkins Hotels in San Francisco. Contact George Gester, P. O. Box 1627, Richmond, Calif.

SEPT. 16-18 — General traffic conference, truck and rail carriers, 11 Western states, Salt Lake City, under Army auspices. Contact: Col. C. D. Penniman, Commanding Officer, 4th Transportation Zone, Salt Lake City, Utah.

SEPT. 21-23—*American Mining Congress*, Metal and Nonmetallic Mineral Mining Convention, Olympic Hotel, Seattle. For hotel reservations contact Housing Committee, Seattle Hotel Association, 315 Seneca St., Seattle.

OCT. 11—*Western States Council*, annual meeting, Salt Lake City.

OCT. 11-12—*Vertical Turbine Pump Manufacturers*, fall meeting, Broadmoor Hotel, Colorado Springs, Colo. Contact B. A. Tucker, secretary, 301 W. Avenue 26, Los Angeles 31.

OCT. 14-16—*National Reclamation Association*, annual convention, Reno, Nevada.

OCT. 16-17—*Automotive Electric Association*, national conference, San Francisco. Contact S. W Potter, exec. secy., 802 Michigan Bldg., Detroit 26, Mich.

OCT. 18-20—*Pacific Northwest Trade Assn.* Fall conference on water resource development, Hotel Davenport, Spokane. Contact D. C. Knapp, executive secretary, 1217 Joseph Vance Bldg., Seattle.

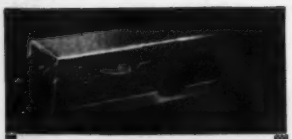
OCT. 20-22—*Pacific Coast Management Conference*, at the Claremont Hotel, Berkeley, Calif. For further information contact California Personnel Management Assn., 2180 Milvia St., Berkeley 4.

OCT. 22-23—*American Ceramic Society*, Western regional conference at Palace Hotel, San Francisco. Contact James Hicks, chairman, at Kaiser Aluminum & Chemical Co., Rt. 6, Box 290, San Jose, Calif.

Save Space! Cut Costs!

with R-W "Zig-Zag"®

Continuous Power Conveyor



Engineered for Economy and Flexibility

- Horizontal and vertical units alternate in a continuous chain traveling through special steel tubing.
- Complete flexibility for installation in any plant. Easily installed, easily changeable to conform to plant alterations.
- SAFE—all moving parts are fully enclosed.
- Low first costs. Low Power Factor.
- Standard horizontal or vertical curves —two-foot radius.

Richards-Wilcox ZIG-ZAG Continuous Power Conveyors are the last word in materials handling efficiency. Products of many sizes and shapes are carried at various speeds, smoothly and safely. Loss through handling mishaps is reduced to a minimum. And the overhead installation releases valuable space for other uses —increases the efficiency of the plant many times.

ZIG-ZAG—a steel, tube-like track through which travels a specially constructed motor-driven chain—will carry unit loads up to 125 pounds at speeds ranging from 1 inch to 60 feet per minute. It's designed to go up and down, in and around "like water through a pipe." And ZIG-ZAG is flexible, too—if changes or relocation are required you can take it down here and put it up there, and in most cases, *use all the parts!*

* * *

Learn how patented ZIG-ZAG can save space and cut production costs. Send today for details—or better yet, have an R-W engineer consult with you at no obligation.

1880 RICHARDS WILCOX R-W AURORA TRADE MARK 1953

Reg. U. S. Pat. Off.

SLIDING DOOR HANGERS & TRACK • FIRE DOORS & FIXTURES • GARAGE DOORS & EQUIPMENT • INDUSTRIAL CONVEYORS & CRANES • SCHOOL WARDROBES & PARTITIONS • ELEVATOR DOOR OPERATING EQUIPMENT

Richards-Wilcox Mfg. Co.

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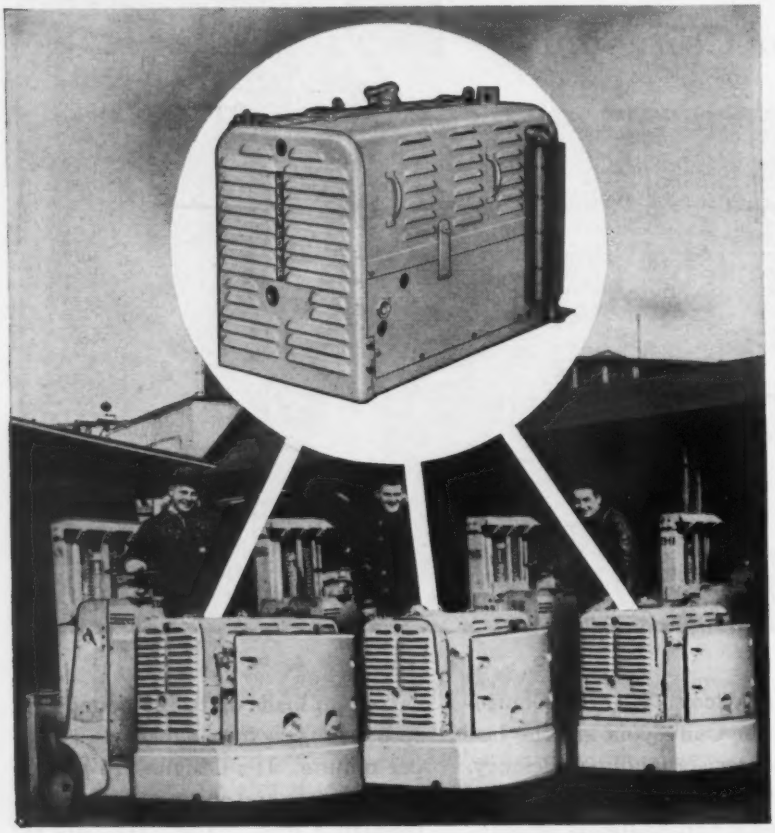
Ready-Power is the only Interchangeable gas-electric power unit



Interchangeable Ready-Power units allow the most simplified and economical system of preventive maintenance known, with *no truck downtime!* One spare power unit permits rotation of maintenance operations while trucks stay "on the job" . . . an important reason why Ready-Power automatic electric drive moves materials at lowest cost per ton mile!

AND CONSIDER THESE ADDED FEATURES . . .

- **ONLY READY-POWER has a manufacturing know-how backed by more than a quarter-century of experience in building gas-electric power units.**
- **ONLY READY-POWER offers Diesel-electric power units for electric industrial truck operation.**
- **ONLY READY-POWER has a complete range of sizes in both gas-electric and Diesel-electric power units to meet the requirements of all sizes and types of electric industrial trucks.**

CONTINUOUS-DUTY POWER UNITS

The READY-POWER Co.

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West Coast Representatives:
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7813 California Ave.
Huntington Park, Calif.

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GEORGE HUNDSDORFER
1424—11th Avenue
Seattle, Wash.

THIS MONTH'S COVER

WESTERN KNOW-HOW speeds replacement

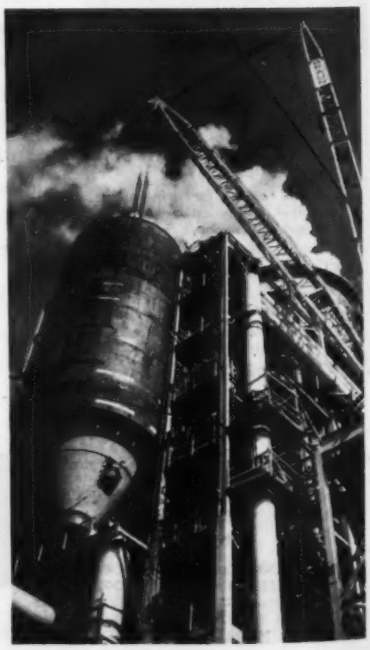
A GIGANTIC REACTOR, part of a catalytic cracking unit at Shell Oil Co.'s Dominguez refinery was replaced and operating in just 28 days.

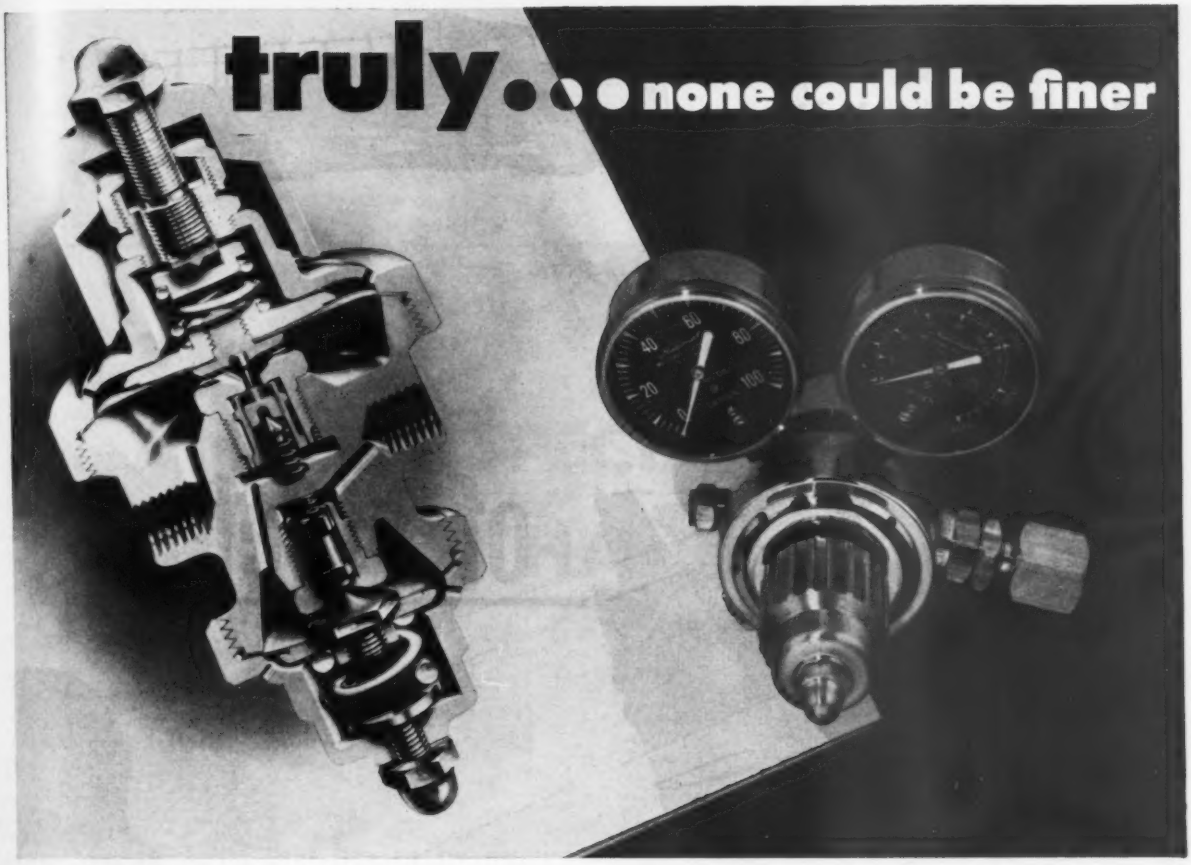
The job, which saved thousands of dollars worth of down-time was done by C. F. Braun & Co., Alhambra, Calif.

A completely prefabricated new reactor was raised in one piece, swung over the existing equipment and lowered into the cracker structure.

Weighing 175 tons, the reactor is 24 ft. in diameter and 92 ft. high. Subassemblies were constructed in the shop from chrome-moly alloy steel, then put together at the refinery. Parent metal adjacent to the welds was held under uniform preheat as the welding proceeded. Field welds were gamma-rayed with radioactive cobalt, shop welds were X-rayed and all welds were radiographed 100%. Root welds were proved up with magnetic-particle inspection.

A 200-TON guy-derrick, towering 240 ft. in the air, is used to replace a reactor in a giant fluid catalytic-cracking unit. The vessel is a part of the Shell Oil Company refinery at Dominguez, Calif. Erection-clearance is less than a hand's breadth.





no matter how much you spend you cannot buy finer regulators than National

AND—here is a listing of the exclusive advantages they offer you:

1. Manufactured by an organization which has been in the welding and welding equipment business for over 40 years — whose original owners and operators own and operate the company today.

2. All major parts are automatically machined from uniform bar stock which assures complete concentricity and, thereby, absolute uniformity. Nothing is rounder than a round bar — and nothing offers greater production uniformity and strength.

3. A fully sealed — nylon bearing — tension screw assembly for effortless, long lasting — silken smooth operation.

4. Self-reseating relief valves which are tamper proof, reliable and sturdy.

5. A patented feature permitting instant change from hand set to a pre-set.

6. Both high and low pressure reduction stages are pressure adjustable.

7. The nylon button takes end-friction out of the tension screw.

8. An efficient inlet filter, with renewable cartridge, is easily replaceable without total disassembly of parts or removal from regulator body.

9. A seat mechanism and seat material which gives longer and more pressure accurate regulator life — which keeps the regulator on the job rather than in the repair shop.

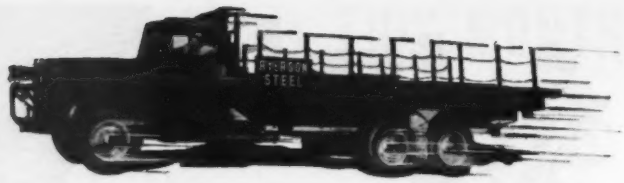
10. Metal diaphragms which are neither too large nor too little and which have been designed for long life and freedom from trouble.

11. Short, properly designed and made tension springs which neither buckle nor bind in service.

528

Made by National SINCE 1910 WELDING EQUIPMENT CO., San Francisco 5, California

For quick delivery



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Ryerson deliveries are fast . . . cover everything from structural shapes and plates of carbon steel and bright sheets of stainless to high-strength alloys.

Ryerson service includes expert engineering aid . . . personal help on your steel problems . . . and sawing, shearing, flamecutting or otherwise preparing steel to your requirements.

With a network of 15 strategically located plants Ryerson brings quality steel quickly to your door. Although some stocks are currently unbalanced from a size standpoint, when you need steel—any kind or quantity—call the Ryerson plant nearest you and we will do our best to meet your every need.

PRINCIPAL PRODUCTS

CARBON STEEL BARS—Hot rolled and cold finished
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SAN FRANCISCO—Plant: 65th & Hollis Sts., Emeryville. Mail: Box 188, Emeryville, California. Phones: Olympic 3-2933, Enterprise 1-0176.
SEATTLE—Plant: 1200 - 4th Ave. Mail: Box 3268, Seattle 14. Phone: Seneca 2300.
SPOKANE—Plant: North 207 Freya St. Mail: Box 2158, Spokane 10. Phone: Keystone 9311.

Western Industry

AUGUST 1953

5th ANNUAL SPECIAL MATERIALS HANDLING ISSUE

EVERYTHING that has to be moved (and what doesn't have to be moved nowadays?) falls within the range of materials handling, the science which is daily winning recognition as a basic and outstanding factor in industrial operations.

Consequently it is natural and logical that *Western Industry* should devote a special issue every year to significant Western ideas and applications of materials handling. Western conditions are different from elsewhere in the nation to a considerable extent, and therefore special treatment in a Western publication is essential.

Industry in the West is taking on certain distinctive patterns, such as the one-story type of plant, the out-of-doors operations impossible elsewhere, and the factories developing without rail facilities. The West is also notable for outstanding materials handling developments in the heavy construction operations concentrated in the West, where a quick pay-off for the expenditure is essential.

Western Industry has taken the lead in urging that the materials handling engineer be made a part of the management team; it also has made the first and only analysis of the extent to which this has taken place in the West (see cover picture and lead article, August 1951).

Western Industry also has emphasized the necessity for counting the materials handling engineer in at the planning stage. It has assembled and published a symposium of Western thinking on this subject (cover picture and lead article, Aug. '52).

This year it is timely to remind management that since materials handling is so important a factor, it should not be considered an ivory-tower job for the materials handling engineer alone, but that all the line executives and supervisors should understand it and be accustomed to including it in their daily thinking.

THE WEST COMES OF AGE IN MATERIALS HANDLING

C. E. HAWKSLEY
Chairman
Los Angeles Chapter
American Material Handling Society
(Material Handling Engineer
Ford Motor Company
Long Beach plant)

THE WEST is coming of age in the materials handling field, just as in other industrial aspects. This is the significance of the formation of the first Western chapter of the American Material Handling Society. As the cost of moving things "from here to there" is such a big slice of operating expenses, we feel that our chapter can contribute much to operating efficiency in industry and bring about a greater appreciation of the importance of materials handling. We trust that other Western chapters will spring into existence soon.

C. E. Hawksley

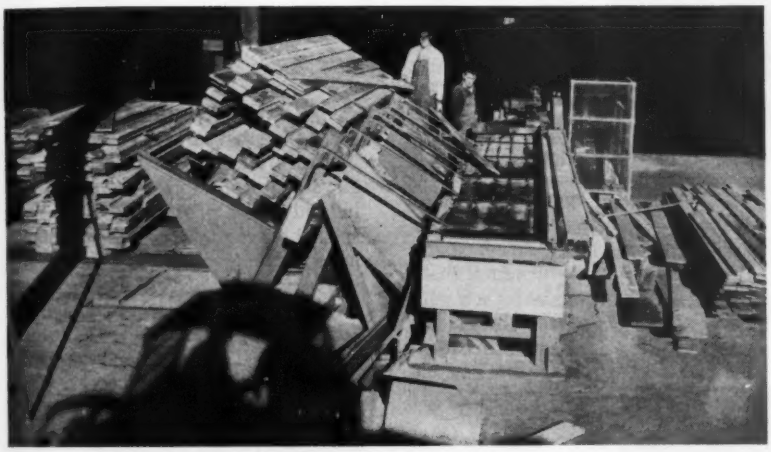
F. R. CHRISTIAN
Regional Director
Society of Industrial Packaging
and Materials Handling Engineers
(Sales Manager
Noland Paper Company, Inc.
Beverly Hills)

PACKAGING and Materials Handling are twin partners. Left to themselves, they can turn profit into loss in the shake of a lamb's tail. Kept under control and carefully studied, they can do an even better job turning loss into profit. Our Society exists for the purpose of keeping these twins where they belong, and welcomes the help of industry in its educational work. Our salutations to *Western Industry* also for its constructive efforts in this great cause through its highly interesting and helpful annual Materials Handling issues.

F. R. Christian

AUTOMATIC LUMBER HOIST

STACKS — UNSTACKS



TALLMAN Tilting Hoist in position with first layer of gravity fed boards being guided down to feed table. At left of hoist are more lumber loads on the floor chains which will carry them to hoist.

INSTALLATION in 1940 of a new planer mill at Union Lumber Co., Fort Bragg, Calif., brought the need of a faster method for feeding stacked lumber into the high-speed planer.

J. J. Tallman, maintenance superintendent, surveyed the need, drew up plans for his tilting lumber hoist and had a model constructed by J. S. Kennedy, chief engineer. By September 1940 the first hoist was installed and operating.

A stacked load of lumber is carried by lumber carrier to floor chains or rollers. A foot-operated switch controls the load and moves it toward the hoist. When the load comes over the hoist, it is tilted to a predetermined angle and slowly raised. As each layer of boards comes to the top edge of the hoist, it slides down an incline onto a table conveyor chain. Boards pass along one at a time to the planer.

Mechanized control

An operator controls all lumber movements with three foot-switches and merely guides the gravity-fed lumber to keep it from jamming. After the load is emptied, the hoist is returned to its original position, where another load is waiting and ready to be unloaded.

Cost of installation varies according to the layouts required in each individual plant. The first ones were installed for approximately $2,500 each in 1940. Today, however, costs may vary between $4,000 and $6,000, depending on the type of installation required. The maintenance costs have been quite low, probably not exceeding $200 per year.

In some plants savings in labor costs pay for installation within four months, depending on the volume of material handled.

Hoists have been built to handle loads varying in width from 4 to 8 ft., with weights varying from 2½ to about 16 tons. The standard hoist for planing mill use handles loads approximately 4 ft. wide and 44 in. high, weighing from 4 to 7 tons. By adding more arms, lumber from 8 up to 50 ft. in length can be handled. Equipped with heavy duty motors, the hoist has an 8-hr. capacity of 240,000 board ft.

Good for other industries

According to Mr. Tallman, his hoist could be readily adapted to other industries than lumber, although so far this has not been done.

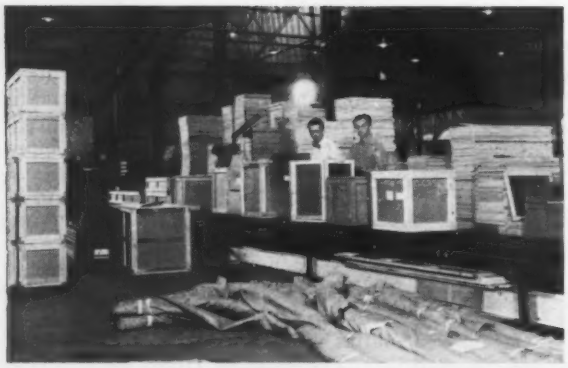
The Tallman Tilting Hoist patent covers the tilting and hoisting mechanisms as well as the safety stops at the top and bottom positions.

A new patent has been taken out on what is called a "reloader" for planing mill and remanufacturing use. It consists of the above type of hoist with some alterations and is made to work in reverse. Taking advantage of gravity, the lumber is fed from a transfer or sorting table onto the hoist's tilted arms. As each layer of lumber is built up on the arms, the hoist is lowered a corresponding amount until the package of lumber is completed.

The hoisting chain then lowers the completed load until it rests on power-driven rolls. The package of lumber leaves the hoisting mechanism via the rolls, after which the arms may be raised and another load started. Arrangements are being made for the manufacture of this new hoist for the lumber industry.

HOIST ARMS nearly in top position. Illustration shows lumber being brought to hoist on rollers rather than on chains.

113 BOX SIZES BUILT FROM 36 STANDARD PANELS



STACKS of prefabricated, cleated Tekwood panels are readily available to shipping personnel for packaging operations.

FINISHED panel boxes with material ready for shipment roll along a conveyor saving considerable time, space and money.

BOTTOM and left side of the table are marked off in two-in. squares, enabling quick estimate of panel sizes needed.

MILTON J. PETERMAN, a shipping department coordinator for Northrop Aircraft, Inc., has developed a system of prefabricated panels costing only 55% of what the equivalent special boxes would cost for warehousing operations at Lynwood, California.

The stocking of various sized boxes in any quantity presents problems of both expense and space. In addition to the standard sizes, special boxes are often required. These special needs necessitated a delay in shipment and resulted in a high unit cost.

Northrop's new system of using prefabricated cleated Tekwood panels for building boxes to fit the material, is recording savings in time, space and material.

A total of 36 panel sizes are stocked, permitting construction of 113 different sizes of exterior shipping containers. Any one of these boxes can be built on very short notice by merely selecting the correct panels and putting them together.

In a typical packaging operation, the shipping clerk places the material to be packaged on a table located beside stacks of panels. The bottom and left side of the table have an area marked into two-inch squares, so that the shipper can tell at a glance just what size box is required for the material on his table. After a quick reference to a chart above the table, the shipper can immediately determine what size panels he requires for his box. The proper panels are quickly nailed together and the material is packaged for shipment.

Net savings to the company through use of this new system have been highly gratifying. Over the first 4-month period it was found that a total of 7,812 panels had been used to make 1,307 boxes. Saving in costs over the initial period was an estimated 45%. In addition to this, intangible savings such as space, time, shipping weight and convenience were also realized.

TRANSIT VAN SYSTEM COMBINES TRUCK AND RAIL ADVANTAGES

Also being tested out by Air Force to speed up loading and unloading of cargo planes

BECAUSE so many industries in the West have developed without rail facilities, depending entirely on truck transportation, the Transit Van System of transportation is of particular interest to the Western area.

The objective of this system is to coordinate the several basic means of transportation through the use of a minimum number of standard containers interchangeable between the basic means of transport—rail, water, air and highway—and so designed as to take maximum advantage of the basic efficiencies of each type of transportation.

For example, for the distribution of many types of supply, particularly certain manufactured products, the truck and trailer show the highest efficiency. However, the direct cost of terminal-to-terminal transportation using this means is in many cases much more expensive than the direct cost of transportation between the same terminals by rail.

Efficiency utilized

The Transit Van System, through its containers transported between terminals by rail and then transferred to trucks for distribution, is designed to take advantage of the efficiency of the railroad for line haul and the efficiency of the truck for distribution. The same principle applies to the coordination of truck and air and of truck and water shipments for certain classes of commodities.

Situations are developing here in our Western states which afford illustrations of some of the competitive problems which the railroads face. The economy of the Western states has been rapidly growing and many new industries have located their plants off rail sidings.

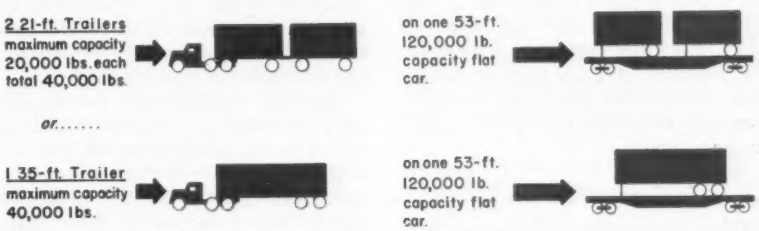
Some of these may have started small but have expanded with the economic development which has taken place in the West. The need for locating on a rail siding in many cases was not urgent because the volume of shipments was small and good truck service was available. Many such industries produce specialty products on which transportation rates are high.

Some have grown to the point where their shipments are most desirable to both rail and truck. The railroads, however, today do not have equipment which will satisfactorily or economically serve off-rail points.

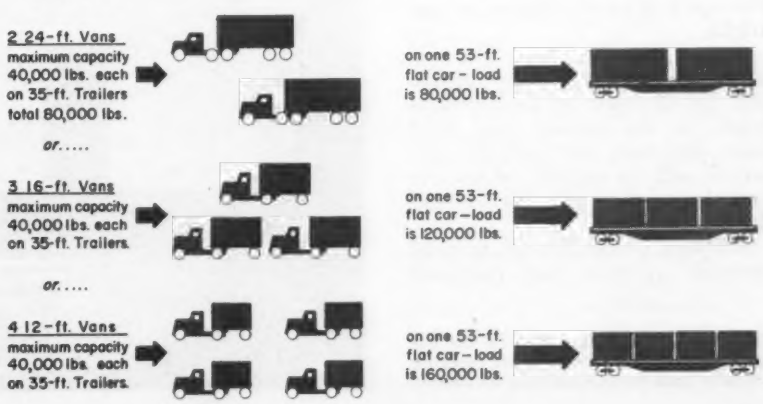
If the railroad wants to serve a shipper who does not have a siding, even though he may be just a few hundred yards from the main track, the product has to be handled into a

What interchangeable containers can do

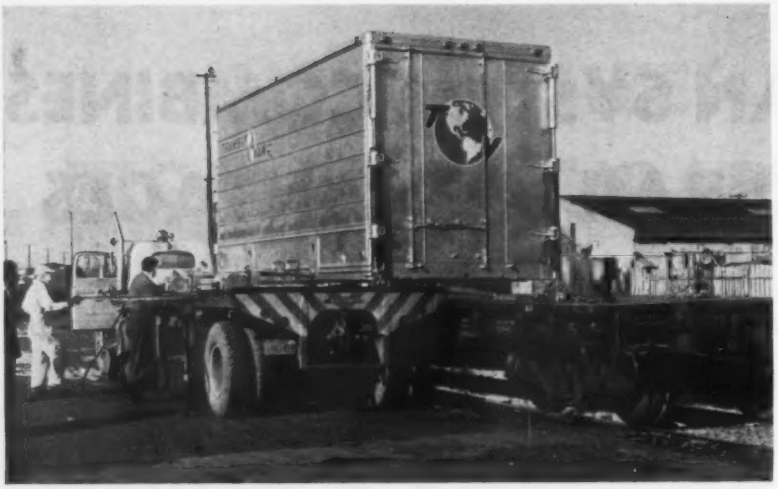
Loading the trailer, chassis and all, on a 53-ft., 120,000 lb. capacity railroad flat car, provides only 40,000 lbs. capacity.....



Loading the van only on the same flat car, provides up to 160,000 lbs. capacity.....



STATE LAWS not only limit maximum weights of truck cargoes, but also prescribe vehicle lengths, number of axles and their spacings. Illustration shows how demountable vans overcome these legal handicaps.



QUICK transfer from flat car to trailer and vice versa requires only simple standard devices carried on the trailer unit.

truck and then rehandled into a rail car, and in most cases the same procedure has to be carried out in reverse at the destination. This consumes time, and in some cases requires expensive packaging, while at the same time subjects the commodity to loss and damage during the handling process.

Between San Francisco and Los Angeles a truckload of some commodities will bring a revenue as high as $400. The trucker's cost for moving it between the two cities is approximately $150. If another load of high-value merchandise is not available when he reaches his destination, he can pull his truck into a plant located on a rail siding and there offer his services, which are often better than those of the railroads at a competitive price, even though this price may be substantially below his cost of operation on the return trip.

Truckers are successful

When he gets back to his original point the low rate and the high rate have averaged out, and he may even have made enough profit to run several more trips at a loss carrying rail carload freight until such time as he is able to pick up a load of higher revenue freight.

It appears to the Transit Van System people that if the railroads wish to stop the diversion of their carload freight to the trucker, they must adopt equipment which will be competitive with the trucker and actively compete for the traffic from off-rail shippers.

Although Transit Van has received favorable comment from representatives of the railroads on the development done on the proposed new type of transportation, and responsible individuals have indicated a substantial interest in the development, Transit Van has as yet been unable to conclude an arrangement with a railroad for a substantial van operation. The reasons for this are varied but in the main probably are institutional ones.

For example, there is the problem of a rate structure which will take full advantage of the economy of a van operation. Such rates may have some effect on the broad rail rate structure, and for this reason the railroads are bound to go slowly. Schedules must be established which are competitive with those of the highway trucker, and this may mean setting up special trains for the movement of transit vans.

Another consideration lies in the type of business organization best suited to the development of van operations. If a van system is put into operation the railroads probably should have a section of their traffic departments especially concerned with getting vanload traffic rather than carload or l.c.l. These and probably many other things enter into gaining acceptance for the proposed system.

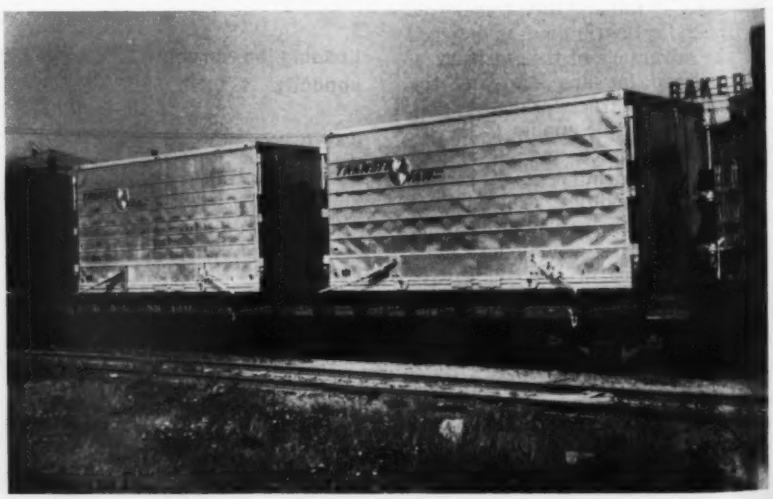
Obviously the railroads would be faced with the problem of deciding whether it would be justifiable to provide an excellent high speed service to shippers who have no sidings, when in the past it has been their policy to encourage shippers to locate on rail sidings. With the Transit Van System the railroads in many cases would be able to provide better service to off-rail shippers than to shippers on sidings using conventional methods. This would further reduce the incentive of certain new industries to locate on property with rail access.

Despite all these objections, Transit Van officials point out that the pattern is set and sooner or later the railroads will have to find an answer to the problem, because until they can effectively compete they will continue to suffer diversion of all classes of commodities which otherwise would be moving by rail.

Aircraft situation

Advantages of coordinating air and highway traffic are particularly important, because the capital cost of aircraft is so high that it becomes essential to load and unload airplanes quickly in order to attain the maximum utility of the equipment.

Commercial freight aircraft today are really engaged in express movements and do not have the capacity to engage in what might be considered large scale freight movement. But it is not unreasonable to expect that aircraft will be developed in the not too



TWO transferable vans on one flat car combine the railroad's superior carrying capacity with trucking service flexibility.

distant future which will be capable of transporting 100,000 lb. or more of cargo at speeds in excess of 400 mph.

Unless some means is developed, however, for paralleling this high-speed, high-capacity line haul operation with a high-speed distribution system and a method for quickly loading and unloading the aircraft so that they can engage in revenue producing operations, the growth of airfreight will be limited.

The Transit Van offers just such an instrument. Not only can the cargo be unloaded quickly from the plane, but even more important, cargoes can be assembled prior to the arrival of the aircraft and rapidly loaded.

It serves as an efficient package and method of securing the cargo against shifting in flight. The van and cargo can be weighed and its center of gravity accurately located for purposes of computing aircraft balance, which is an important requirement.

Cut loading time

It is estimated that it takes an average of about one hour to place properly each 10,000 lb. of cargo in an aircraft and securely strap it to the aircraft floor, using conventional methods. Obviously, unless more rapid means are developed for handling the cargo into the aircraft and securing it in place, it might take as long as ten hours to load a 100,000-lb. capacity aircraft and nearly as long a time to unload the aircraft.

Such an operation would materially limit the effectiveness of air transportation. However, with a van system such as proposed, regardless of the size of the aircraft, the aircraft and van system can be so designed that it can be completely unloaded and reloaded in literally a matter of minutes.

Another advantage of the van system is that the compartmentation of the load into vanloads simplifies the problem of securing the load to resist inflight forces. This is an entire new field for development but appears to hold great possibilities.

Transit Van . . . its history and background

DEMOUNTABLE truck bodies for rail transportation are not a new idea, but the Transit Van System is the organization that has devoted the most study and effort to converting the idea into a practical operating device.

Wetmore Hodges, who put the Birdseye system of freezing foods on a commercial basis and negotiated its sale to General Foods Corporation, began study of the idea shortly after World War I, and surveyed the possibilities of demountable bodies as applied to the transportation of frozen foods.

In 1935 and 1936, committees working for the Federal Coordinator of Transportation, Joseph Eastman, set forth the need for a national container system and outlined their views on specifications in considerable detail.

In 1948 the Transit Van Corporation was incorporated, starting initially as a development project of the Hodges Research and Development Company of Redwood City, Calif., of which Wetmore Hodges is president. Hodges Research was joined by North American Car Corporation, a railroad car operating company of Chicago, Illinois.

Prior to building prototype equipment, a representative was sent to Europe to study the container systems in operation on the railway systems there. A number of such systems have been developed in Europe and are in operation on the railroads of England and on the continent.

In 1949 two prototype rail vans approximately 20 ft. long by 8 ft. wide and 8 ft. high were developed, and standard highway trailers were modified to carry these containers and transfer them from the deck of the flatbed semi-trailers to the deck of a railroad flatcar. The two vans on a flatcar were roughly equivalent to a carload of the classes of merchandise which were transported. They were put in service on the Southern Pacific Railroad between San Francisco and Los Angeles in intensive test operations.

The equipment functioned satisfactorily and the records kept of the test indicated a substantial saving over conventional transport. The savings accrued from reduction in costs of handling the commodities, as the vans were loaded at the shipper's plant whenever possible and transferred from the trailer to the flatcar without intermediate handling of the shipment. It was also found that the loss and damage in these shipments was negligible.

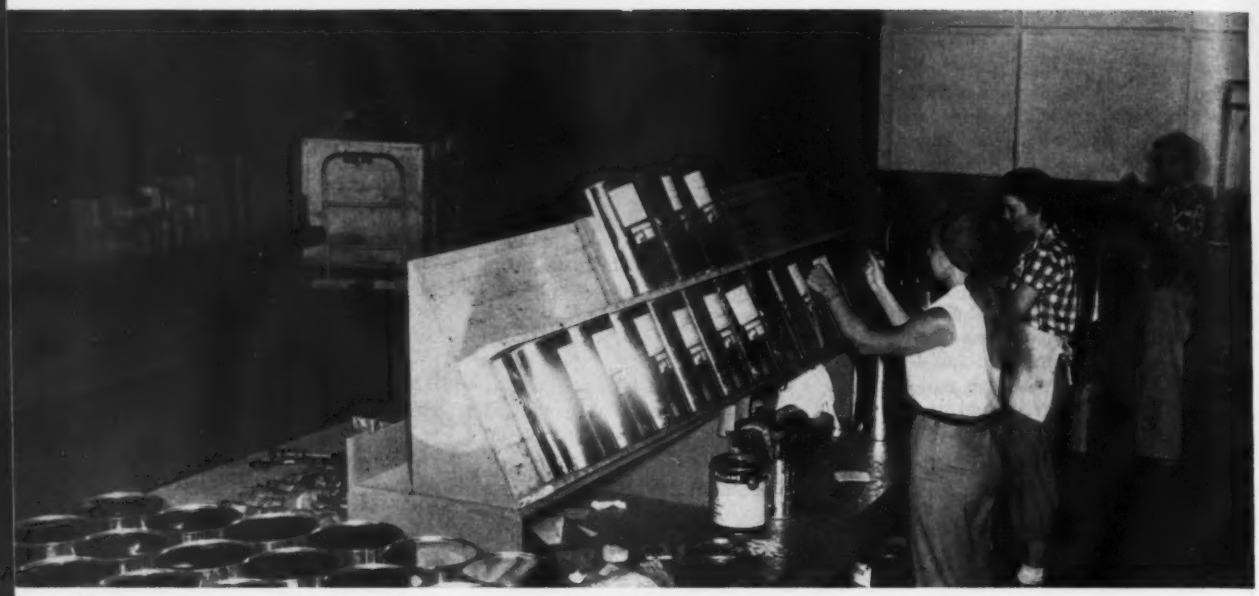
It became clear that the use of the vans to load and unload the rail car resulted in higher utility for both truck and railroad rolling stock, as the loading and unloading operation could be accomplished in approximately 15 minutes.

Although the movement of highway trailers on flatcars has enjoyed some popularity, the van system was followed for several reasons. First, because of the relationship of highway weight laws to the carrying capacity of the modern rail car, the van system makes it possible to carry as much as four times the load on a flat car if highway trailers were placed on the same flat car.

Other advantages include lower capital cost of the van equipment once production quantities are reached; greater safety because the van can be placed flush on the flatcar deck and as a result can be more easily secured to the flatcar; reduction in taxes as the vans in a system are not vehicles and not subject to vehicle tax.

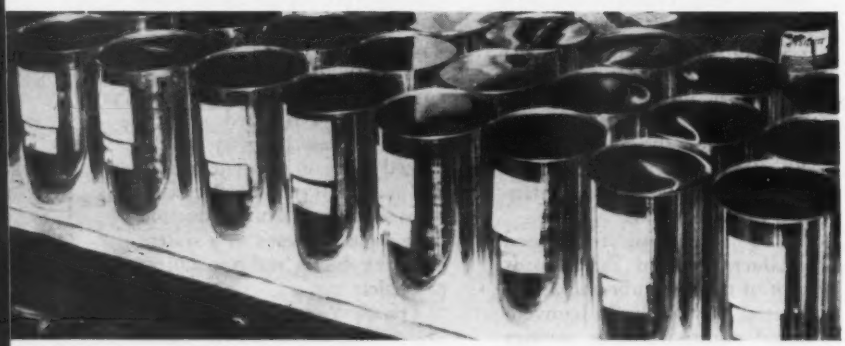
Transit Van is now engaged in working out for the Air Force a solution to the problem of loading and unloading large aircraft. They have just completed an order of 12 full-scale vans for packaging supplies for movement by air and loading and unloading one of the large Air Force aircraft, which will carry three vans. Tests of the van units are slated to begin within the next few weeks, both in airlift operations to the Far East and in the United States.

Heading up the operation is John Alison, combat air officer in World War II, and later Assistant Secretary of Commerce for Aviation.



ONE WOMAN prepares the cans for sealing, a second seals them while a third adds the labels.

HERMETICALLY SEALED CANS FOR PACKAGING SMALL ITEMS



They provide successful vapor barrier, and need much smaller amount of dehydrant or desiccant

THERE IS an age-old uncontested axiom, "You can save if you will." Lockheed's Shipping Department has found that the irrefutable logic contained in that Ben Franklinish principle is just as tenable when the thought is reversed, "You will save if you CAN."

About mid-1951 those preservation and packaging methods known as IIC and IID were comparatively examined. (Under Government Specification MIL-P-116, Method IIC is, "Cushioned Item—Flexible Barrier—Cushion—Carton," and Method IID is, "Cushioned Item—Rigid Barrier," both of which contain desiccant, or drying agent, and humidity indicator.)

The review disclosed that Method IID (using cushioning, or protective padding, and rigid barrier or container) was by far the superior container for a large percentage of those parts then being packaged by Lockheed under Method IIC (using cushioning, flexible barrier or moisture-vapor proof bag, a second cushioning, and a carton).

Change for the better

Cognizant of the objective that a pack should be changed when a new method will "provide an equivalent or higher level of protection for the product at reduced cost to Lockheed and to the customer," the Shipping Department moved to procure a canning machine and an inventory of cans.

The possibilities in canning aircraft parts were relatively simple to ascertain, but the possibility of selecting the right sealing machine and the "impossibility" of maintaining an inventory of a fairly wide range of standard and custom-made cans in rather large quantities were not so easy to evaluate.

The type of parts involved in the Method IIC (or IID) packs at Lockheed may be generally classified as light weight aircraft accessories. Following is a summary explanation of these packaging methods:

By

J. D. NUNN

Manager
Shipping and Receiving
General Department
Lockheed Aircraft
Corporation
Burbank, Calif.

A. Method IIC

(Employs specification papers, moisture impervious barrier, cushioning material, humidity indicator, desiccant, special cartons and specification type tape.)

Operations performed:

1. Wrap part.
2. Cushion part.
3. Enclose in heat-sealed moisture impervious barrier—with desiccant and indicator.
4. Cushion barrier.
5. Place in carton.
6. Tape carton (all seams and flaps) to make waterproof.
7. Affix specification labels.

B. Method IID

(Employs specification papers, cushioning materials, humidity indicators, desiccant and cans.)

Operations performed:

1. Wrap part.
2. Cushion part.
3. Enclose, with desiccant and indicator, in hermetically sealed can.
4. Affix specification identification.

Under Method IID, that is, the hermetically sealed can, the most time consuming operations characteristic of Method IIC are eliminated, namely steps 3, 4, and 6 of the above summary. The can is substituted for the carton; mechanical sealing of the can replaces the bag heat sealing as well as carton closure accomplished with expensive specification tape. The cost of the moisture impervious barrier and/or the W-5 type waterproof corrugated carton approximates the can cost. The following advantages are available through utilization of the canning method:

1. High quality packaging.
2. Zero level physical damage.
3. Above-average resistance to corrosive deterioration.
4. Reduced cost.
5. Reduced cubic dimensions and gross weight.
6. A convenient package—strong, and with surprising utility as respects reusableness, not necessarily as a moisture-vapor proof barrier, but storable in much the same manner as a housewife caps and retains opened, partially filled cans in her refrigerator.

Wells E. Ellis, Research Metallurgist; O. L. Maag, Lubrication Engineer, and M. J. Benach, Packaging Coordinator, in their "Evaluation of Bearing Packages,"* state, "To date the results from both accelerated storage tests and actual storage tests have indicated that the metal container of the food-can type shows great promise for use as a unit container in packaging bearings. The performance of the metal can has been superior to that of any other method we are familiar with for packaging bearings intended for long-term storage under the most severe conditions."

A CAN SEALING operation prepares the cans for labeling and packaging. Additional cans are available on short notice.

It is the opinion of those in the shipping picture at Lockheed Aircraft Corporation that the acceptance of the hermetically sealed can for bearings (which have highly critical surfaces, very susceptible to corrosion) is tantamount to full acceptance for light weight aircraft accessories.

It was concluded that arranging on-the-spot storage for large quantities of cans is a difficult, if not impossible, undertaking. This problem was resolved by Lockheed through procuring cans from a supplier under a warehousing agreement with delivery accomplished on short notice "as required." The cost for such service still permits considerable savings over the old method.

* *Modern Packaging*, May, 1953.

Five standard can sizes, 301 x 208, 301 x 411, 404 x 700, 603 x 408 and 603 x 812, as well as two special-order sizes, 800 x 800 and 800 x 1200, are being used in the current canning operation; two additional special sizes, 603 x 1200 and 800 x 1000, are on order; and it appears unlikely that sizes other than these will be required. (Can sizes are designated as diameter by height, with the last two digits indicating sixteenths of an inch, and the initial digit or digits, inches—for example, the 301 x 411 is the ordinary food can in which we buy corn or string beans.)

Saving range

As regards the question of savings, this can only be defined in general terms unless specific parts were under detailed discussion. The range of savings extends from 10% to 60%. As previously stated, the greatest economy factor is in the increased productivity of the packaging personnel.

Considerable progress has been made in the switch from IIC to IID packaging. Coincidental similar action has been initiated to switch from Method IA8 to IA5 packaging (IA8 and IA5 packaging methods are respectively identical to Methods IIC and IID, except that the humidity indicator and the drying agent are omitted) to the extent warranted by cost reductions.

The Lockheed Shipping Department can well be proud of having participated in the pioneering of hermetically sealed canning of light weight aircraft accessories by the aircraft industry.

Hermetically sealed cans are being used successfully for military packaging and could be used to advantage by civilian manufacturers of electronic equipment, generators and other electric parts. Anything small that must be shipped into difficult climates or requiring long storage will benefit from the protection afforded by this successful vapor barrier.

SPARE PARTS are wrapped in paper and dunnage (a shock-resistant Kim-pac) before placing in hermetically sealed cans.

VIEW of sub-assembly showing parts bins in use

PORTABLE BINS SOLVE PARTS HANDLING PROBLEM

Attach them to fork lifts and move them around as the need arises

By
FAY BRAINARD
Vice Chairman
Oregon Section
American Society
of Mechanical
Engineers*

AS MANUFACTURERS of materials of materials handling equipment, our company has had perhaps a more than average awareness of our own materials handling problems. One of these problems from the first has been that of handling and storing our large inventory of spare parts for production needs and for Parts Department backlog.

Difficulty dates back

This materials handling problem dates way back to the beginning of the war, when constantly changing production demands, relocation and expansion of plant areas, often made it necessary to move various departments overnight. In order to make these moves with the least possible delay in production time, we designed a bin which could be handled by the fork lift trucks which we manufacture. These bins are designed to be stacked one on top of the other to form sections two stories high with catwalks in between.

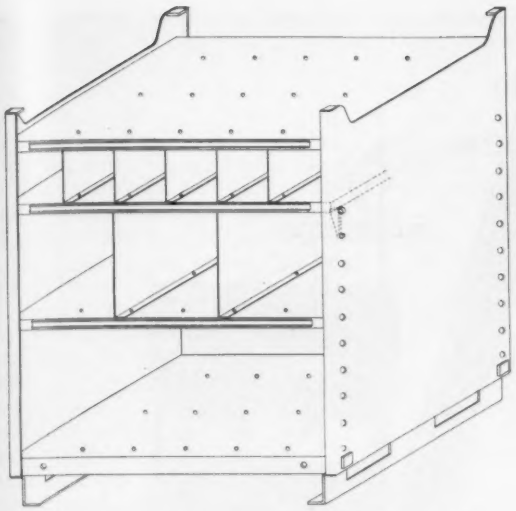
*Assistant to General Manager, Hyster Company.

Due to wartime shortages of materials the first thousand of these bins were made of wood. They were three feet high, three feet long and two feet deep. After the war, when restrictions were relaxed, a steel bin was designed with flexible type of partitions and shelves. About 1,500 of these bins are now in use at our Portland factory.

Versatile design

The bins are designed so that shelves and dividers can be arranged on six-in. centers or any multiple of six in. By using special shelf locks and divider clips, it is possible to rearrange shelving in a bin very quickly from the inside and without the use of any tools, which is important when they are stacked close together.

Supplemental facilities of skips, pal-



LARGE PARTS can be stored below, and smaller items above, as the above sketch of construction details of the bins reveals.

AS THE LIFT trucks move along Hyster's main assembly line, the parts needed at each station are supplied from the bins, thereby eliminating one of the required handlings of parts.

lets and tote boxes have been standardized to fit in with the two-ft. and three-ft. floor area of the portable bins to allow complete flexibility in storage, planning and rearrangement.

The value of these portable bin sections has been proved many times over the years. For example, on two occasions it was necessary to move the entire spare parts storage to another location, one of these moves being over a distance of three miles. With this type of bin we were able to make the move in a matter of days, compared with weeks and even months using ordinary bin installations.

Another advantage is that even heavily loaded bins can be easily moved and rearranged by fork truck.

Less handling

The bins are excellent for transporting parts and material stored in them. Parts are undisturbed during the move, their position remains intact and customer service continues uninterrupted.

Storage areas can be modernized as the need arises and the bins can also be used to transfer parts from storage areas to production and assembly lines.

This latter use is a simple but effective method that has proved invaluable to Hyster's production schedules. Very briefly, it works like this: When a production order for 25 lift trucks, for example, is scheduled, our Central Stores Department immediately begins assembling a complete set of parts for 25 trucks. These parts are arranged in the bins so that they will be convenient when placed on the assembly line. Next, the loaded bins are transported to their proper station on the assembly line.

When the production order is started through the line, all the parts are on hand, in the exact amount, to build those 25 trucks. This system has completely eliminated lost parts and overages and has saved much lost time handling and ordering replacements.

WHEN a production order for 25 units is scheduled, the Central Stores Department (below) starts assembling complete sets of parts, which are then transported to the main assembly line. The system has completely eliminated lost parts and overages.

LONG BEACH (above) is typical of many West Coast ports, thoroughly modern in many respects, but limited when it comes to bulk facilities, and therefore not in position to compete vigorously for bulk cargoes with East Coast and Great Lakes ports.

A must for an up-to-date West...

BULK LOADING FACILITIES COMPARABLE TO THE EAST

SINCE THE WEST has grown by leaps and bounds, blossoming out into a major industrial area, the growing need for a really modern bulk materials handling installation has become acute.

Geographically natural Western markets have been slowly siphoned off by the more efficient and competitive Eastern firms, due to faster loading times and more economical freight rates. Even with a 100% improvement in Western shipping facilities in the last decade, the time seems to have come for the area to build one complete loading and storing equipment installation that can compete with the East.

Expanding West

Growth in the West has brought not only numerous branches of Eastern firms and new Western firms but continually increasing respect for industrial development from the rest of the country. With stability of industry increasing every year, the area has "come of age" and is now ready to compete

with the rest of the world in shipping bulk materials, such as coal, as well as many other fields.

Eastern facilities have several major advantages over ours in the West. These are higher speed of loading and unloading, lower cost per ton for these operations, and generally lower railroad freight rates. Let us consider first dispatch of loading.

The cost of tying up one Liberty ship, for example, is roughly $1,840 per day. This cost contributes to the over-all loading costs per ton. A difference of one to three days also greatly affects the flexibility of shipping schedules and ability to meet market commitments. At the present time the West (that is, ports of Portland, Seattle, Stockton, Long Beach, etc.) requires one to two days to load or unload a vessel. On the other hand, Eastern ports of Norfolk, Virginia, Newport News and stations on the Great Lakes require roughly half this time for loading or unloading similar vessels.

Cost per ton

The other important consideration is cost per ton of material loaded. At today's prices, Eastern ports are able to load and trim bulk materials for approximately 30¢ per ton. The West is endeavoring to compete, with loading costs per ton of from $1.40 to $1.80.

Bulk loading facilities on the East Coast have developed to their present efficiency for several good reasons.

First of all, European markets are well established.

Second, heavy industry is concentrated and bulk handling of materials is one of the major methods of transportation in this area.

Third, the large investments required to back proper types of bulk handling installations were financed by the East's major railroads. These railroads banded together to subscribe the capital to protect their own interests. When these most efficient plants were built, the amount of bulk handling for the year could be rather safely predicted.

Fourth, a large percentage of coal, grain, ore and other bulk materials that are actually exported or shipped by water are found in the Eastern seaboard or near the Great Lakes region.

A fifth reason might be that the East's industries are better developed, more predictable and better established, thus making the tremendous outlay of capital necessary for an efficient bulk handling port more easily raised.

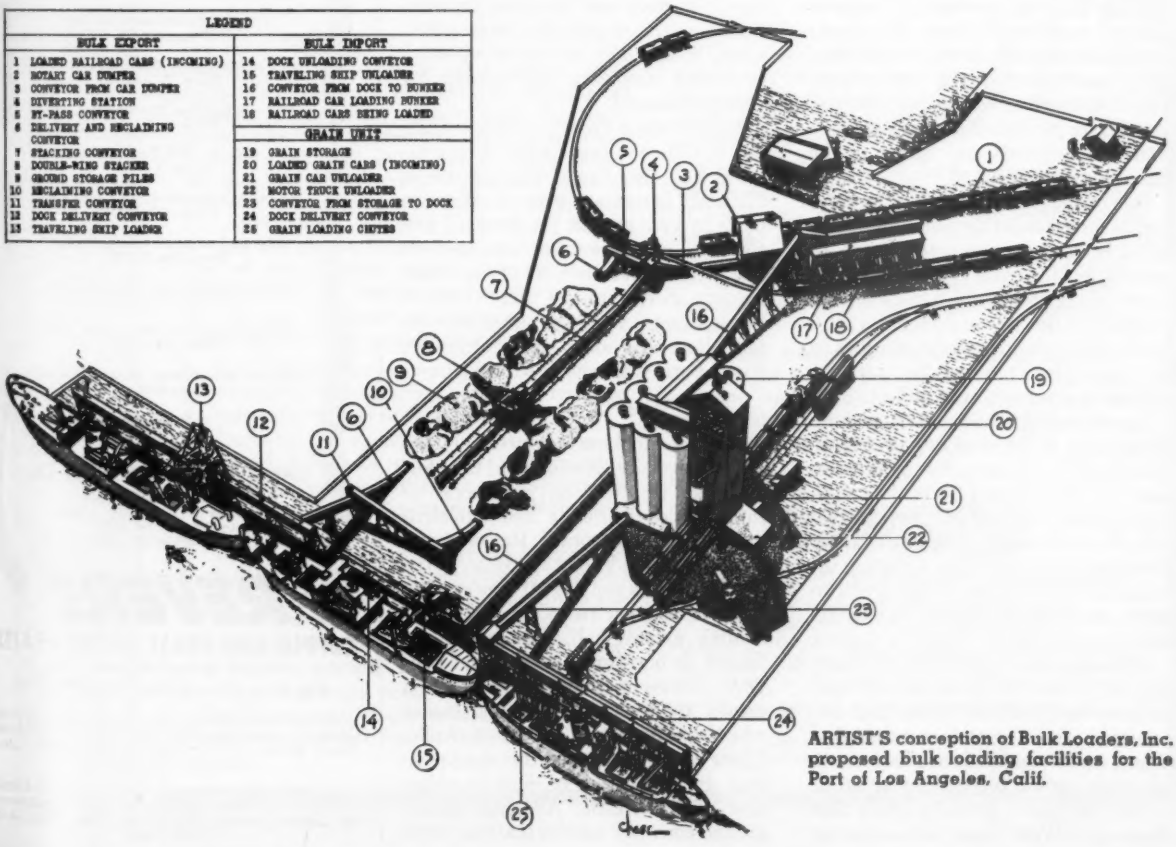
A sixth reason could be the ability of the East to usurp the markets of the West, thereby dragging in more than their share of Western trade.

Feasibility of the West building one really complete bulk materials handling installation is increasing year by year. The investment would be necessarily large, probably several millions. Major problems to be overcome before such an installation could be built are as follows:

1. Subscription of the necessary capital.
2. Justification of the investment to industrialists through the predictable use of such an installation.
3. Development of markets in the East to handle bulk products in excess of those now in existence.
4. Desire to get back into competition with the East Coast and, by lowering tonnage prices, gain back some of the market that belongs to the West. A great deal of this shipping business, particularly coal, goes to the East Coast merely because the West is incapable of handling it at a reasonable rate.

Competitive business

Bulk materials handling in the East has become a highly competitive business. Competition has developed to a point where a $1 per ton shipping and handling charge is sufficient to affect



ARTIST'S conception of Bulk Loaders, Inc. proposed bulk loading facilities for the Port of Los Angeles, Calif.

PORT OF STOCKTON has one of the best locations for a bulk loading installation in the West being on three major railroads and having access to extensive storage facilities.

the margin of profit or loss, and so influence the letting of a bulk handling contract.

Government financing

Present feasible proposals seem to indicate that the government, state or federal, could well afford the investment in a centrally located bulk handling installation on the West Coast. This installation could be backed, possibly, in conjunction with subscriptions from the railroads and leased to the interests that needed it.

One of the primary reasons for having the government support this installation is the apparent need of such an installation for national defense. Such a port would facilitate handling bulk products in time of an emergency, and considering the unsettled conditions in the Orient, it could well be part of a preparedness program as well.

An example of the need for such an installation is the shipping of coal to Korea. Since the outbreak of the Korean war, the United States has shipped a quarter of a million tons of coal annually to Korea. It is estimated that a modern bulk materials handling installation would have, in the past two years, saved the United States approximately a quarter of a million dollars.

Although the volume of bulk materials to be handled is not usually predictable for the West Coast from one year to another, it stands to reason that if such a port was made available, bulk materials for the West Coast would be routed through it. It is also likely that shipping of West Coast bulk materials would show an increase as a result of such an installation.

In a rundown of Eastern and Western bulk materials handling facilities, *Western Industry* editors have attemped to analyze the differences between Eastern and Western installations and the reasons for these differences in the light of apparent need, economic feasibility and predictable volume handled.

Bulk loading facilities from a number of different ports have been analyzed and the East-West differences discussed in terms of the area. Western ports covered include the Port of Long Beach, Los Angeles Harbor, the Port of Portland and the Port of Stockton. Eastern ports studied were Toledo-Lucas County Port Commission, Norfolk Port Authority and Delaware River Port Authority.

West Coast ports

Port of Stockton has probably the most modern installations and the most desirable location, having access to three major railroads and sufficient room for outside storage. Railroad cars empty their loads, one at a time, at the rate of 70 cars per day. It is necessary to move each car twice during the unloading, as only half a car can be unloaded at one time. An inclined conveyor carries the bulk commodity, at a rate of 400 tons per hour, to a stacker which discharges it into a stockpile. There are two wings on this stacker so that stockpiling can be done on either side of the trestle. A single underground conveyor carries material from

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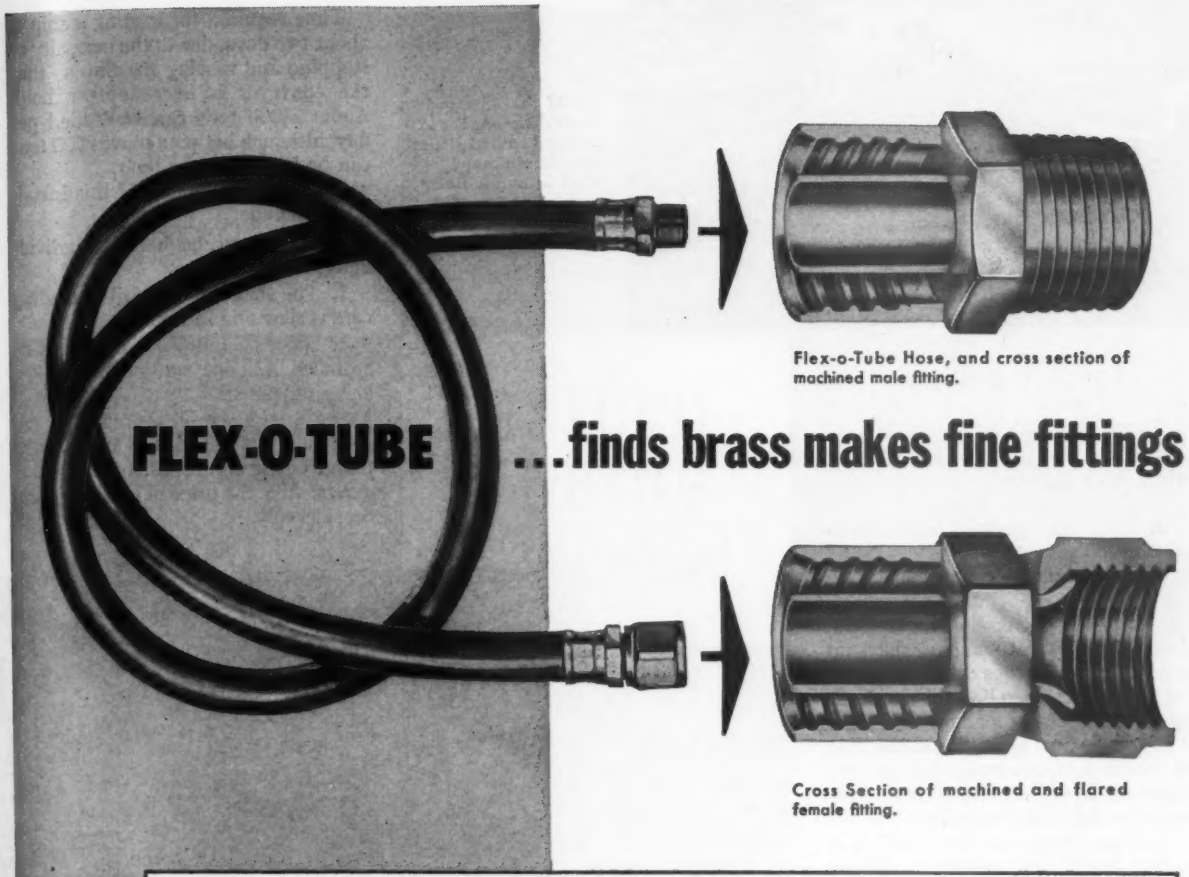

Flex-o-Tube Hose, and cross section of machined male fitting.

FLEX-O-TUBE ...finds brass makes fine fittings

Cross Section of machined and flared female fitting.

For quick, accurate and economical machining, free-cutting brass rod is preferred by many companies, such as Flex-O-Tube, Division of Meridan Corporation, Detroit, Mich. This company makes hose assemblies and fittings to conduct air-oil-water-gasoline and hydraulic power for the automotive, farm implement, machine tool and aircraft industries. Some of these hoses have a minimum bursting pressure of 20,000 pounds per square inch, which gives an indication of the tightness required, which can be obtained only by strength and accuracy.

Flex-O-Tube has found six points of superiority for brass over other metals, as follows:

1. Brass "flows," or is ductile, so that no cracks result during the crimping operation required to fasten the fittings to the hose.

2. Ductility and strength inherent in brass act to provide a superior seat to fittings designed to control fluid flow. Competitive metals are either too hard or too soft to give positive closing and tend to leak.

3. Where the design of the fitting is intricate, necessitating removal of considerable metal by machining, the automatic screw machines can be run faster with free-cutting brass rod.

4. Brass has a high scrap value, and the scrap sold back to the mill increases brass supplies.

5. The break-even point between brass and other metals is especially favorable to brass in the sizes of rod that Flex-O-Tube buys.

6. Customer preference is for brass, which is universally recognized as a quality metal. Hence brass fittings are more readily sold, and in fact often are specified regardless of size or price differentials.

Included in the Flex-O-Tube operations are machining, flaring, crimping, and annealing to assure the proper ductility for flaring and crimping.

Revere is an important supplier of brass rod to Flex-O-Tube, and has also collaborated with this customer through the Revere Technical Advisory Service.

If you wish information about brass and how one or more of the Revere brasses can add to the economy and saleability of your product, get in touch with the nearest Revere Sales Office. See your telephone directory or write direct.

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Pacific Coast District Sales Offices in San Francisco, Seattle, Los Angeles.

PORT of Portland uses a car shaker to unload railway cars one at a time. Port is municipally owned and leased to users.

the reclaim pits to the tipple and into the ship's hold.

Major disadvantages of port are:

1. Cars have to be moved twice while being unloaded.
2. Car unloading is slow.
3. Conveyor from pits to the stockpiles is inflexible.
4. Single inflexible conveyor carrying bulk commodity to the ship necessitates movement of the ship to load different holds. Moving of the ship after every 1,000 tons or so are loaded requires the crew to be kept on standby, thus increasing loading cost.

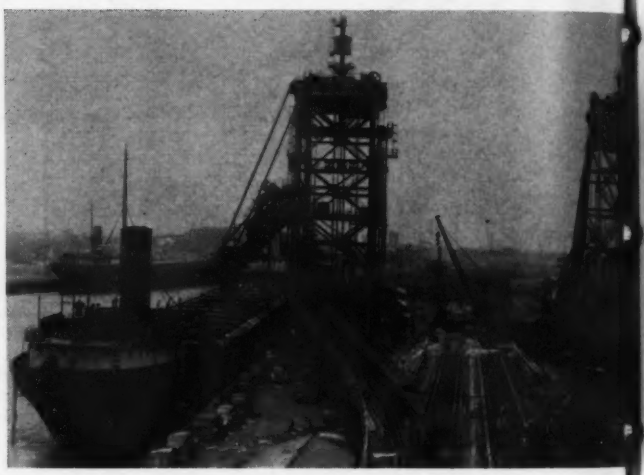
Required time of loading at the Port of Stockton is one and a half to two days. An average of 200 cars is required to load each vessel.

Portland Municipal Terminal No. 4 is city owned and leased out for the loading of coal, dust petroleum, phosphate rock, super phosphate and grain. Railroad cars are moved into a shaker shed where they are shaken until empty. The bulk commodity is carried from this shaker pit up a conveyor to the towers, out a steel boom, then down the telescopic spout and out the trimmer at the bottom into the ship's hull. From the shaker pit the commodity can also be carried along a ground-level conveyor and deposited in outdoor stockpiles a considerable distance from the docks.

Time required for loading a ship is about two days, due to the necessity of stopping and moving the ship so that the conveyor is over another hold. About 3,000 tons can be loaded per day, although between moves 600 tons can be loaded in one hour.

Major disadvantages of this installation include:

1. Cars must be handled individually.
2. The shaker method of unloading cars is slow and inefficient.
3. Space is limited and cars must be switched back onto another track after being unloaded.
4. During the process of loading, the ship must be moved at least a dozen times. Labor costs contributed in this moving hike the price of bulk handling considerably.



TOLEDO, equipped with twin loading machines, is a good example of the most modern and efficient of Eastern bulk facilities.

NORFOLK and Western Railroad facilities at Norfolk, Virginia, include a 1,000-ft. pier capable of handling 40 cars per hour.

Port of Long Beach is quite similar to the other two mentioned except that it features direct handling only, having no storage facilities. Capacity is 200 tons per hour, and at least two days are required to load a Liberty ship. Loaded cars come right down onto the docks, and coal is emptied into a pit between the tracks. It is then scooped up by a mobile conveyor, and by means of a flexible arm is loaded into the various holds of the ship. The installation is municipally owned and has no outside storage facilities.

Disadvantages of this installation are:

1. The fact that it is municipally owned and leased out to stevedores, who in turn make a profit on the shipper.
2. Lack of outside storage, reducing efficiency and flexibility.
3. Slow handling of the cars, due to limited space and storage facilities.
4. Necessity of moving the ship every time the loading conveyor is

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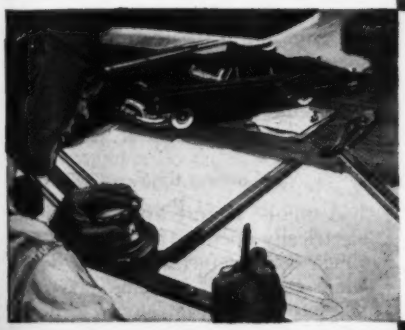

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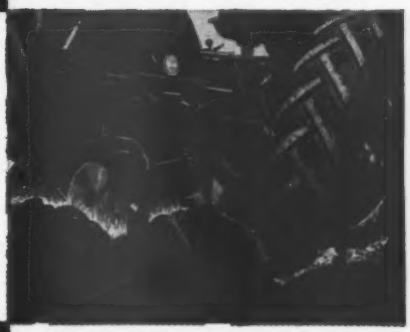

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moved from one of the ship's holds to another one.

Bulk Loaders, Inc., have proposed an interesting installation for the Port of Los Angeles. This plan has been some years in the making, and the outcome as to size and facilities is still a matter of conjecture. Incorporated in this plan would be a number of facilities that make Eastern installations so economical and efficient for large volumes of material. Loaded railroad cars would come into a rotary car dumper where they would be picked up, emptied and put back on the track.

Double-winged stacker

After passing the delivery and reclaiming conveyors, the bulk of the commodity would go out on the stacking conveyor and be poured into stockpiles through a mobile double-winged stacker. Two rows of piles on either side of the stacker conveyor would then be automatically transferred up onto a dock delivery conveyor and loaded into the ship through a traveling ship loader. This traveling loader would allow bulk commodity to be loaded evenly into all holds without having to move the ship along the dock.

The Port would also have a dock unloading conveyor and traveling ship unloader with material conveyed from the dock to bunker and loaded back into railroad cars. A third unit of the plan handles grain. Grain cars would be unloaded as are motor trucks, the produce being stored in giant grain elevators. From here a conveyor would carry grain to the docks and down loading chutes into the vessel.

This plan, if put into effect, would be the most efficient and versatile on the Coast. It would handle products from truck, box car and gondola car, and provide both indoor and outdoor storage facilities. However, with present prospects for bulk handling volume, the outlay of capital required for this plant could not be easily justified. It is estimated that the plan here outlined would require a capital investment of around $10,000,000. A planned loading output of 600 tons of petroleum coke per hour is called for, and this is not nearly fast enough to reduce loading costs to anywhere near a comparable figure with those in the East. In selecting a spot for a modern bulk loading installation, it is imperative that rail freight rates and distance to natural resources be carefully considered.

Eastern ports

The Greenwich tidewater coal dumper in the Philadelphia area of the Delaware River is typical of Eastern bulk handling operations.

This facility has two modern rotary coal dumpers with an approximate capacity of 1,000 tons per hour each. There is a 60-car capacity thawing plant and bunkering facilities for tugs and small vessels. Adjacent to these docks is an extensive storage yard. Railroad cars of coal are emptied by a rotary coal dumper at the approximate rate of one car per minute. Cars are then allowed to coast under their own power down an inclined plane and up another incline, after which they are automatically switched, and their momentum carries them back to the marshalling yards. Coal from the rotary dumpers goes either to the storage yard to be stockpiled or is conveyed to a traveling loader alongside the water. A traveling conveyor train facilitates the loading of these vessels without moving them along the pier.

ROTARY coal dumpers pick up and dump the railroad cars at rate of a car a minute.

Bulk loading facilities in the Port of Norfolk capable of dumping an entire car at one time are operated by the Norfolk and Western Railway and the Virginia Railway. The Virginia's pier is equipped with two double Wellman-type lifting car dumpers, each handling two 55-ton, one 70-ton or one 105-ton road cars at one cycle. The pier is supported by a hoisting pan conveyor, car units and four loading towers, each with an automatic rotating trimming machine. Deflector plates deliver coal to the vessel through a cowl or overtrimming belts. These belts are designed with variable speed motors, the operator having control of the speed for increasing or decreasing flow of coal as the trimming of the vessels requires.

Capacity of this pier is 7,200 tons per hour. It is capable of loading several vessels simultaneously. The pier is also equipped with automatic sprinkling devices for settling the dust, is 1,074 ft. in length, and can accommodate four vessels simultaneously.

Norfolk and Western Railroad facilities include a 6,200-car classification and storage yard, a 200-car repair yard, and one 300-ton and two 200-ton track scales, providing ample capacity for efficient and speedy loading of numerous classifications of coal. A low-level pier, electrically operated, eliminates breakage of coal without retarding capacity. The 1,000-ft. pier is capable of handling forty 120-ton cars or fifty 70-ton cars per hour. It can accommodate the largest ships carrying coal on the Atlantic Coast and has a handling capacity of approximately 1,000 tons for each 24-hr. day.

Coaling time cut

A unique feature of the pier is an electrically operated bunkering barge which delivers fuel coal to the vessel while cargo coal is being taken on, neither operation interfering with the other. Approximately one-fourth of the usual coaling time is saved.

The largest, most modern dock plant on the Great Lakes is operated at Toledo, Ohio, by the Baltimore and Ohio and New York Central railroads. The installation has three piers with three electrically-operated coal dumping machines, each capable of dumping loaded hopper cars at the rate of one per minute, to fill the holds of lake vessels destined for Canadian and U. S. lake ports.

The middle pier is equipped with twin loading machines, one on either side, fed from a large marshalling yard. Loaded cars come from the yard up a ramp to the loading machines and are emptied by means of rotary car dumpers. Located 600 ft. from the water end of the pier, this installation allows the largest coal-carrying vessels to load without extending beyond the end of the pier. The empty car descends the ramp and goes back to a marshalling yard.

From these summaries of Eastern and Western facilities, a comparison is gained which puts the West in a rather poor light. However, the West has lagged behind for very good reasons.

1. Lack of ability to predict volume of bulk loading to be handled within a given period of time.

2. Reluctance of private capital to finance such an installation.

3. Railroads in the area cannot justifiably support these facilities as has been done in the East, due to the difference in the West as a geographical unit and the diversity of methods of transportation in the area.

On the other hand, it would appear that a government-financed bulk un-

loading installation on the West Coast is feasible and could be justified by:

1. Availability to the government during any period of emergency.
2. Probability that such an installation would tend to stimulate shipment of bulk commodities.
3. Profit that could be made through leasing these centrally located facilities to private industry.

An investment of several millions would be required to build an installation such as is common in the East. This facility should have a rotary car dumper, automatic switching and handling of empty cars, outdoor storage space for stockpiles, and a flexible loading system.

Probably the best locality for such a port would be in the Stockton area. This area is centrally located on the Pacific Coast and is a railhead for three large Western railroads.

Although the volume of any given bulk commodity to be shipped in the coming year is unpredictable, it is believed that a modern facility of this type would be used sufficiently to amortize the capital invested over the necessarily short period of time.

Seventy-five per cent of the coal deposits of our country are located West of the Mississippi River. Although a great deal of this is mined for local consumption, perhaps the export market would be increased if a bulk loading facility was installed.

The great difference between loading costs in the East and the West can ultimately be tied down to railroad rates and labor costs. These costs can be cut to a point where the West could compete with the East to a much greater degree, through installation of a modern and efficient bulk loader.

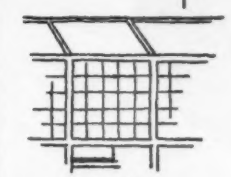
CONVEYOR TERMS and definitions

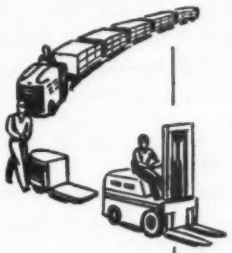
A NEW and revised edition of conveyor terms and definitions is just off the press at the Conveyor Equipment Manufacturers Association, after the first edition of 10,000 copies was exhausted. The exact meaning of such words as grizzly, grasshopper, wishbone, mother, apron, etc., is given in this manual, which lists 1,500 terms and shows line drawings of more than 80 types of conveyors and parts.

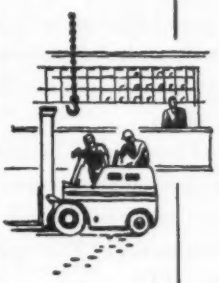
The aim of this dictionary is to banish the costly confusion within the conveyor industry itself, between the conveyor manufacturer and his customers, and among users of conveyors.

"Conveyor Terms and Definitions" is available from Conveyor Equipment Manufacturers Association, 1 Thomas Circle, Washington, D. C., at $1.00.

IF YOU'RE BUYING MATERIALS HANDLING EQUIPMENT







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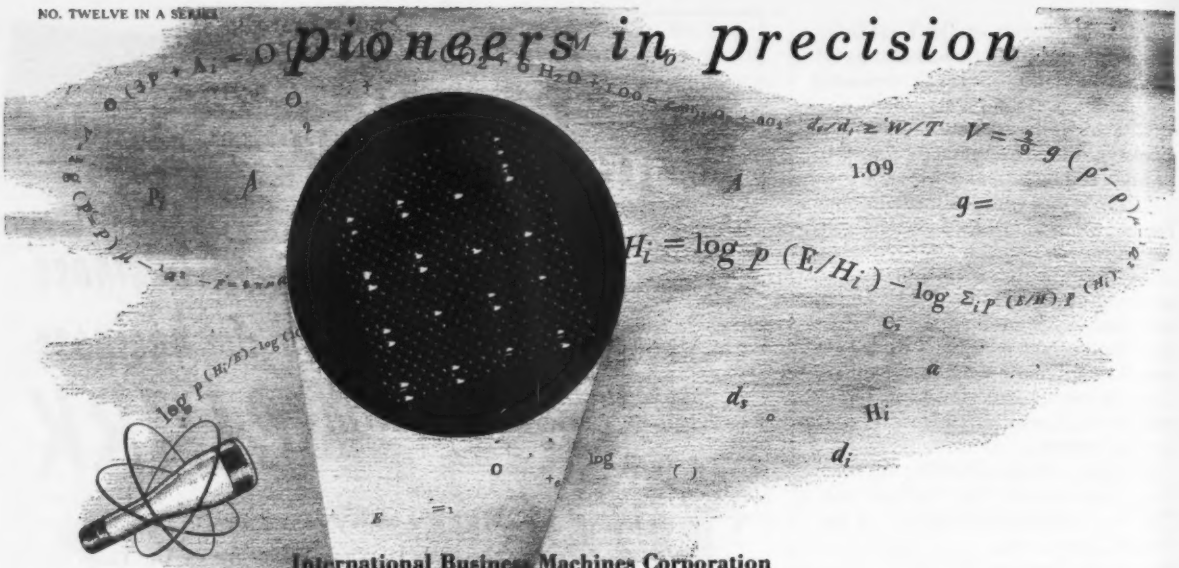

International Business Machines Corporation
recently installed the first production model of the IBM high-speed electronic calculator, the "701." Most recent successor to the pioneer large-scale digital calculator first developed by IBM in 1944, the "701" solves in minutes a problem which would take one man, using a desk computer, seven years to complete.

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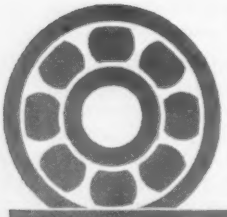

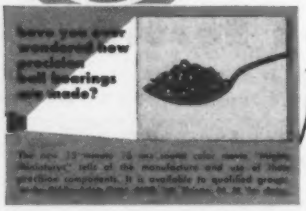

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ELECTRIC TRUCKS CHEAPER IN WAREHOUSE TESTS

A CAREFUL ANALYSIS of cost figures over a five year period has netted San Francisco Warehouse Co. an accurate guide as to the relative efficiency of its electric- and gasoline-powered lift trucks.

Results of this analysis have shown repair and maintenance costs on electric-powered lift trucks to be only one-fifth as expensive as on gas-powered trucks under these particular operating conditions.

San Francisco Warehouse Co., organized in 1899, is one of the largest public warehouse operations in San Francisco. Activities take place in three San Francisco warehouses. All trucks, both electric- and gasoline-powered, operate under nearly ideal conditions. All operations are indoor, on smooth pavement, and in a clear, dustless, non-corrosive atmosphere. Warehouse areas are pretty well consolidated, the average length of run being only about 200 ft. Trucks of both types range in capacity from 1,500 lb. to 6,000 lb. Palletized loads are stacked up to four high.

Check these capacities

A breakdown of the capacities of both electric- and gas-powered lift trucks now in operation follows:

ELECTRIC TRUCKS

No.	Weight (lb.)	Load Length (in.)
3	1,500	32
1	3,000	48
5	4,000	48
2	6,000	48
11		

GAS TRUCKS

No.	Weight (lb.)	Load Length (in.)
2	3,000	48
5	4,000	48
2	6,000	48
9		

San Francisco Warehouse Co. found that the crux of the case lay in the amount of down-time for repairs required of their lift trucks. It was found that amount of down-time went hand in hand with the amount of repair and maintenance costs.

Every time one of the lift trucks breaks down, a mechanic must be called in or it must be sent out to be fixed. Although rates paid these repair agencies are about average, costs are greater than they would be if the warehouse system maintained its own shop facilities.

Repair work is necessarily slower under this arrangement, and so down-time is increased. The company does not believe that the small number of trucks warrants maintaining its own repair service, and consequently finds that it must operate lift trucks requiring very little down-time in order to keep costs at a proper low level.

Repair costs do not include tire costs, for the reason that there does not appear to be a significant difference of cost between the two different types of trucks. Cost of a tire set is about fifteen dollars, with a life expectancy of about two years.

Due to the constant nature of warehouse handling of material, down-time is always critical. Drivers are thrown out of work temporarily and often cannot be shunted into some other operation. Drivers of these trucks are virtually trained on the job. There is a fair turnover, and with new, green men being put on the job, wear on the equipment is rather high, despite ideal operating conditions.

The warehouse is organized around lift trucks, and consequently truck failures tend to reduce warehousing operations to a standstill.

Fuel costs of the two types of lift trucks were also analyzed. Costs of gas and oil were estimated to range from $1.25 to $1.75 a day. Variables which make this range broad are: (1) size of truck, (2) number of hours run, (3) price of the gasoline, (4) other factors, such as size of load, skill of driver, condition of motor, etc.

Charging cost estimates

An estimate of the cost of charging a 600-ampere-hr. battery on an electric lift truck was $1.75 per day. Estimate was based on the cost of the battery being $2,100 with a life of 1,800 cycles, a $1,000 charging unit on a 20-year depreciation schedule and current charging costs of 2¢ per kwh.

Although it is well known that the initial investment in the electric truck with battery and charger is considerably greater than in the gas-powered truck, the San Francisco Warehouse Co. considers that depreciation costs on the trucks are comparable and somewhat favorable to the electric.

Results of these analyses have shown the San Francisco Warehouse Co. quite conclusively that with comparable depreciation, tire and fuel costs, and a down-time and repair cost ratio of five to one, electrically-powered lift trucks are far superior to gasoline-powered lift trucks for this particular operation. Seeing the writing on the wall, San Francisco Warehouse Co. is year by year increasing its percentage of electric lift trucks.

Gas vs. electric

HERE is a rundown of the two types of trucks, showing maintenance and repair costs incurred during the years 1948 through 1952:

Year	Trucks	Maintenance and Repair Costs
1948	6 gas*	$1,921.03
	6 elec. (new)	21.12
1949	7 gas	1,741.71
	6 elec.	337.91
1950	7 gas	1,969.10
	8 elec.	285.07
1951	7 gas	3,400.18
	8 elec.	744.21
1952	8 gas	1,371.23
	10 elec.	577.53

*As of January 1, 1948, the company had on hand 5 gas-powered trucks with an average age of 2 yr.

Average repair and maintenance cost per truck by year

Year	Gas-Powered	Electric-Powered
1948	$ 320.00	$ ——
1949	250.00	56.50
1950	282.00	35.75
1951	587.50	93.00
1952	172.00	59.75
	$1,611.50	$243.00

Average cost per year per truck:

Gas-powered	$322.30
Electric-powered	$60.75

(ABOVE) Before installing the conveyor, hot blocks were scooted by hand into hoist boxes because they were not case-hardened enough to hoist with tongs. 16 hours cooling ensued.

(RIGHT) As it is now. Blocks shown emerging from spray chamber and being loaded into hoist boxes to be taken to furnace pits.

CONVEYOR SYSTEM SOLVES COOLING PROBLEM—

Saves $30,000 outlay for carbon anode boxes, enables one transfer crane to serve three furnaces

THE CARBON Department at the Mead Reduction Plant of Kaiser Aluminum and Chemical Corp., Spokane, Wash., manufactures carbon anodes, approximately 15 x 20 x 13 in., weighing about 200 pounds. The anodes are formed by compressing a hot mixture of coke and pitch under high pressure in a hydraulic press.

These anodes must be conveyed to hoist boxes, baked in pit type furnaces and delivered to the potrooms where they are used as anodes in the aluminum reduction cells. Intermediate cooling is necessary before the blocks can be packed in the baking pits. Expanded production operations made it necessary to develop new methods of cooling and delivering blocks to the baking pits.

The old method of loading the boxes was to skid hot carbon anode blocks from a gravity roll conveyor, known as the block line, into the box, using a slide with steel runners between the conveyor and the box. The momentum of the block coming down the inclined conveyor was utilized to bring the block into position.

Disadvantages of old method

Blocks were loaded in three tiers in the boxes. The first tier rested on the bottom of the box. The second and third tiers were each supported by three laminated boards covered with steel sheet. The boxes were stored for about 16 hr. to allow sufficient air cooling. They were then transferred to the furnace building, where the blocks were packed in the baking pits and the boxes returned to the block line. Disadvantages of this old operation were:

1. The heavy blocks, at a temperature of about 120 deg. C., had to be manhandled from conveyor to boxes.

2. Boards had to be moved back and forth in the boxes to get the blocks in and out of the boxes.

3. A temporary storage area was needed for the loaded hoist boxes where the hot carbon anode blocks could cool in air for 16 hr. until the pitch binder material cooled below the softening point, thereby developing enough strength to support their own weight when picked up by tongs in the furnace pit packing operation.

The decision was made to install a carbon anode cooling-conveyor system when plant operations called for an additional carbon anode furnace building. The old system could not handle the increased production schedule of carbon anodes without major investments in additional hoist boxes. A complicated two-crane system of transferring the loaded boxes would have been required to handle the increased production, and cooling storage area required presented a major problem.

It was recognized, therefore, that two primary obstacles had to be overcome before the third furnace went into operation. First, proper cooling of the green anodes after pressing had to be provided. Second, the transfer crane had to be relieved of the extra burden placed upon it to service another furnace building. Kaiser Aluminum operating, engineering and research per-

Acme Steel Strapping Insures S.A. *(Safe Arrival)*

Strapped shipping cartons pass Maytag Co. torture tests

BOUNCED AND BATTERED. Acme Steel Strapping holds securely as fibreboard shipping carton is vibrated and then butted on each side and bottom in Maytag Company "torture chamber."

MINIMUM MANPOWER. Top and bottom caps on carton containing Maytag automatic washer are each secured by one turn of ½-in. Acme Steel Strapping. Straps are tensioned by push-button operated Acme Steel pneumatic stretcher.

FINAL STEP. After strapped cartons move speedily and safely through packaging department, they are loaded into freight cars and quickly anchored with Acme Steel Strapping.

The Maytag Company of Newton, Iowa, insures S.A. (Safe Arrival) of all its automatic washers by using Acme Steel Strapping both to seal fibreboard shipping cartons, and then to anchor those cartons securely in freight cars.

The strapped carton method was adopted only after torture tests proved it superior to other methods.

An added advantage is that packing the Maytag Automatic with Acme Steel Strapping takes less than half as much manpower as a similar Maytag operation employing previous packing methods.

If you have a packaging problem, chances are Acme Steel Strapping or Acme Steel Stitching Wire methods can provide just the solution you need. Telephone your Acme Steel representative, or write Acme Steel Products Div., Dept. W183, Acme Steel Company, 4901 Pacific Blvd., Los Angeles, Calif.

ACME STEEL

STRAP IT . . . STITCH IT . . . SHIP IT . . . SAFELY!

sonnel worked closely together to design a system that had the two-fold purpose of delivering cooled anodes directly from the presses to the furnace buildings, independent of the transfer crane.

Water spray cooling

Preliminary engineering work on the general features of the system was done at Mead, and final design was completed by Kaiser Engineers in collaboration with Mathews Conveyer West Coast representatives.

Four methods of cooling green anodes were tested: (1) water immersion, (2) water immersion with violent agitation, (3) water sprays and (4) fog cooling. Of these, cooling by means of water sprays was found to be the most efficient with respect to effective cooling, time of cooling and water consumption. Certain specified operating conditions were established to insure the proper degree of cooling and block strength.

The other phase of the project included the layout of a conveyor system integrated with the cooling process, for delivering the cooled blocks to loading stations in each furnace building. The plan finally decided upon provided for three loading stations, one on each of the old furnace buildings and the third in the transfer building.

These stations were situated so that they formed a "U" pattern which made it possible to encircle the three legs of the "U" with a loop conveyor. The station at the bottom of the "U" is serviced by the transfer crane and is used most generally for loading carbons going to the new furnace building. Cranes in original furnace building service other two loading stations.

To cool the hot blocks, a water spray chamber approximately 100 ft. long and 4 ft. wide, equipped with over 100 spray nozzles, was installed. Blocks are conveyed through the spray chamber on a power driven belt conveyor at such a rate that the blocks are exposed to the sprays for a prescribed length of time. Fresh water continually pumps to cooling chamber from plant wells.

Seven tangible advantages

After leaving the spray chamber, the blocks ride around the circuit on a Mathews Conveyer No. U-4 4-in. pitch chain, designed to travel around curves and permitting complete power throughout the system.

A total of eight jib booms, equipped with air hoists, swing out over the chain conveyor at the three loading stations. At these points, loaders pick up the slowly moving cooled blocks with tongs and set them in empty boxes alongside the conveyor. A crew of four men perform this job, including hooking for the cranes. No boards are needed, since the blocks are case hardened sufficiently to be stacked three high without undergoing any distortion.

This installation, which was put into operation in January, 1953, has proven very satisfactory and has accomplished the following purposes:

1. Enabled one transfer crane to service three furnaces.
2. Saved a $30,000 outlay for new green carbon boxes and boards by releasing enough of the boxes formerly tied up in cooling storage to equip the third furnace.
3. Eliminated the nuisance and maintenance cost of boards in boxes.
4. Reduced the number of crane moves per box, saving crane time and minimizing block spillage from boxes.
5. Simplified loading of carbons in boxes.
6. Insured delivery of cooled blocks, safe to pack, at the furnace pits at all times and did away with a congested cooling storage area.
7. Saved extra handling cost of removing carbons from storage when carbons in transfer area were too hot to pack.

AVOID COSTLY DELAYS!

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WEIGH IT IN TRANSIT RATHER THAN CHANCE IT

JET ENGINE packages at North American plant shown being weighed by a Martin-Decker scale-equipped lift truck.

MATERIALS HANDLING and warehousing problems are being partially solved at North American Aviation Corp. by use of an indicating scale on their hydraulic lift trucks.

The materiel section handles a considerable variety of aviation essentials, including airplane engines and all their apparatus. All equipment is separately packed in containers, many of which are heavier than their contents. These are highly expensive items, and in certain instances extremely delicate. Thus, they must be handled carefully while being transported from manufacturing centers and unloaded for assembly.

Many trucks in use

The materiel warehousing department operates a fleet of hydraulic lift trucks, each equipped with a small, ruggedly built weighing apparatus that is sufficiently accurate for the majority of handling operations performed. This scale merely consists of a dial indicator actuated by the same hydraulic pressure that lifts the load. Simply operated, it gives the weight of the load directly without any calculation or interpolation. It has an adjusting mechanism that permits setting a tare so that the net contents of each package can be read right off the indicator.

The advantages to be derived from the conversion of these little fork lift trucks into traveling scales are many:

1. Operators can prevent overloading their trucks, thus extending the life of the trucks.

2. Shipping loads can be checked quickly and almost automatically as they are placed aboard railway cars or heavy trucks at the plant.

3. Weights of incoming consignments can be similarly checked.

These advantages eliminate the necessity of bulk weighings at some wayside public scale and at the same time build up an accumulation of weight data valuable for many purposes. Operators become increasingly familiar with the weights of the various items handled and the containers in which they are packed, avoiding errors ordinarily resulting from uncertainty.

Jet engine packages are now equipped with runners so that the fork of a small lift truck can be projected underneath and can lift up its load gently. There is no thudding of crates nor rolling of boxes on the floor. The whole process is quiet, harmless and fast.

While the lifting and shifting goes on, the lift truck driver can at any time find out exactly what weight he has aboard by noting the gauge reading while he is traveling, or by stopping the forks sharply as load is lowered.

Containers for the jet engines that come into the North American plant weigh from 1,300 to 1,500 lb. The engines themselves weigh approximately 4,500 lb. Thus a loaded package weighs 6,000 lb., about a quarter of which is attributable to the container. If these were being handled without actual knowledge of their weight, it would be difficult to tell from the outside whether or not the package is loaded. With a scale on the lift truck, however, differentiation is a simple matter.

An even more difficult situation is that involving an engine part known as the after-burner assembly. The piece in the package weighs several hundred pounds less than the container. Differentiation between "empties" and "fulls" would again be difficult under ordinary conditions of handling, but with the lift truck scale it is almost automatic.

The uses of such a device are many and various. It is in effect a surveying instrument that can tell, without the necessity of opening a particular container, whether or not it contains all that it should. It can be employed to check almost any kind of warehousing or transporting operation in which weight is a deciding factor. It is an accurate measuring device that can help any plant or warehouse to avoid loading floor sections, platforms, elevators or mobile equipment beyond safety limits.

Guesswork out

It takes all the guess out of weight handling so that the warehouseman no longer "thinks" he knows. He actually does know, and in a completely orderly way is informed of every change in weight distribution *as it takes place.* The weighing and loading function, or the weighing and storing function, can be performed in a single operation.

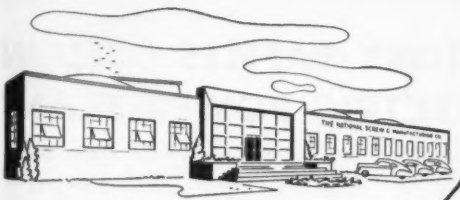
The lift truck scale is simple, rugged and dependable. The gauge is an oil-filled instument requiring no lubrication. All that is required is to connect a tee into the hydraulic system at the base of the lift cylinder or at the control valve. Next, mount the gauge where it will be plainly visible to the driver, connect the gauge hose to the tee, bleed the air at the plug, and the assembly is ready for use.

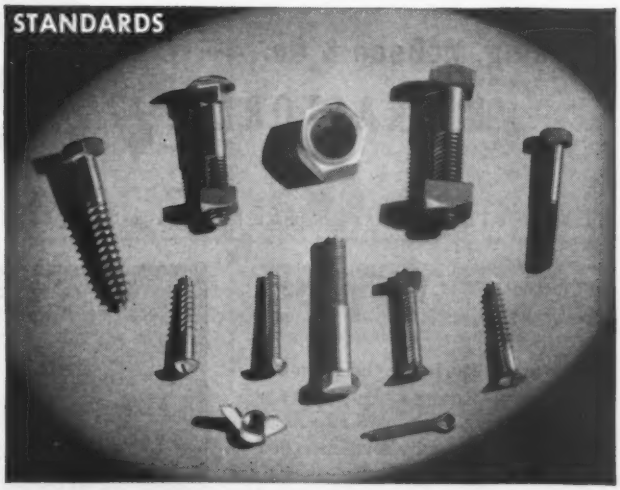
The lift truck scale is a development of a Western concern, the Martin-Decker Corp. of Long Beach, California, the world's largest manufacturer of weight indicators.

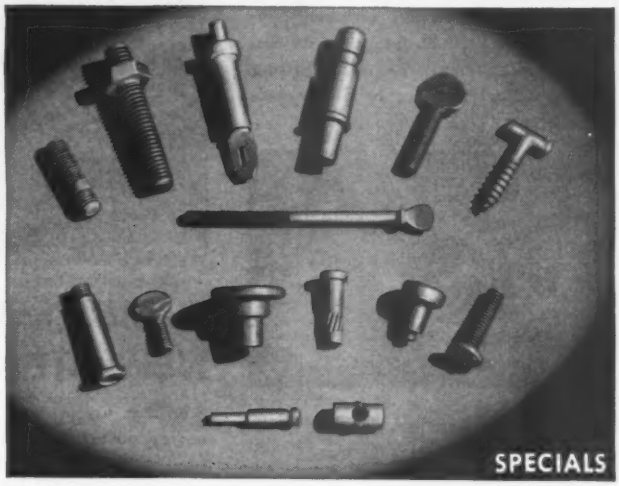
These scales are available in stepped-up capacities from 2,000 lb. minimum to 20,000 lb. maximum, the price being the same regardless of capacity. Each is equipped with a pulsation damper to steady the indicator needle and permit a well-defined reading.

For Western-made Fasteners

and the complete *NATIONAL* line







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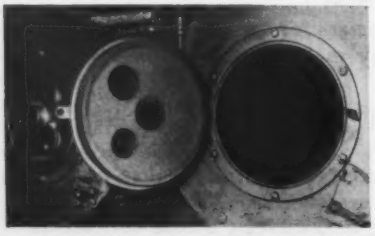
REFRACTORIES Reporter

NEWS-VIEWS OF INTERESTING WESTERN INDUSTRIAL DEVELOPMENTS

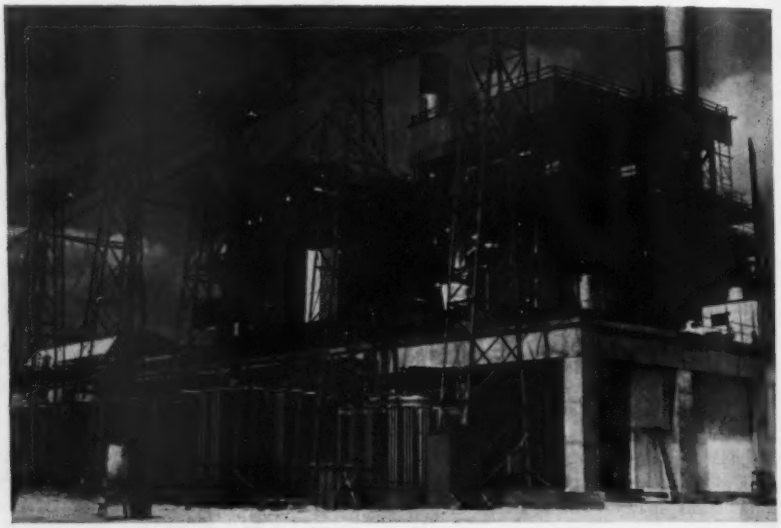
CONSTRUCTION MAINTENANCE TIPS

Refractory material in the form of a castable mix is today widely used in new furnace construction, as well as a repair material for existing installations. Gladding, McBean's *Refracrete* is especially formulated for this purpose. It can be mixed and handled like ordinary concrete. In many cases, this material can be used to advantage to patch existing furnace walls by casting or slap-troweling methods.

The photo above illustrates the use of *Refracrete* to form a skew-back for the main roof arch of a new incinerator. Note the step-back brick construction which provides anchorage for the castable which is being trowelled to the correct face angle. It is also used for furnace sills, jambs, arches, monolithic combustion chamber linings and baffle construction in boilers.



***Refracrete* can also be used to line furnace doors (photo above) and for casting special shapes, such as burner blocks. For more detailed information on this useful refractory material, write for *Refracrete* technical data or call the nearest Gladding, McBean & Co. office.**

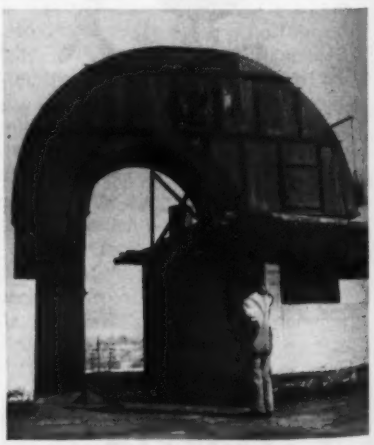


G-McB REFRACTORY BAFFLES USED IN NEW STEAM-ELECTRIC POWER PLANT

Southern California Edison Company's newest power plant, now under construction at Etiwanda, California, has been carefully engineered for maximum efficiency and minimum maintenance. This modern, steam turbine plant employs two huge boilers, each designed to produce 950,000 pounds of steam per hour at 1950 p.s.i. pressure and at a temperature of 1000° F. Each turbine-driven generator will produce 125,000 kilowatts of power at peak capacity. To insure maximum combustion efficiency, specially designed refractory baffle shapes were manufactured for this job by Gladding, McBean. Their purpose is to guide the flow of gases for maximum boiler efficiency. Photo shows near-complete plant.

INSULATING MATERIAL SAVES MONEY IN SMOG CONTROL INSTALLATION

The large metal duct pictured at right is designed to gather cupola exhaust gases as they pass upward from the furnace of a large West Coast foundry. The duct and down-pipe extension is protected from the hot gases by a 4-inch lining of Gladding, McBean No. 110 Insulating Plastic. The use of this protective lining material eliminated the necessity of using stainless or other high temperature resistant alloy metals. In effect, it cut the cost of smog-control at this plant.



GMcB FIRST IN THE FURNACES OF WESTERN INDUSTRY

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PALLET RACKS PROVIDE ECONOMICAL WAREHOUSE SPACE

Effective way to combat rising costs, and to reduce range of your material handling operation

By
A. A. HAMMONS
Special Products Sales Representative
Butler Manufacturing Company

IN SPITE of the steadily rising cost of warehouse floor space, pallet rack manufacturers have not clearly shown a number of companies how they might increase the effectiveness of existing space.

It is readily apparent that some installations cannot utilize pallet racks, particularly those spaces devoted to block type storage where accessibility to any particular pallet is not required, and the loads are self-supporting. This type of storage is well illustrated in the food packing industry, where huge blocks of storage space are loaded with only one commodity and no aisle space is required.

Almost any other type of storage problem usually should be investigated for use of pallet racks. Basically the most apparent uses fall into three general categories.

Storage of fragile goods

This type of commodity cannot be handled in block type storage, as its pressure sensitivity makes it impractical to store one pallet load on top of another without damaging the lower loads.

We encountered this problem in a large business form company. This firm felt they were expending too much space in storing rolls of carbon paper. One load could not be stacked on top of another, as the top load would damage the edges of the bottom rolls and make it impossible to feed the rolls into the automatic folding and cutting machines. As a result they were using their floor space with pallets containing only one tier of paper.

Pallet racks reduced the floor space requirements by two-thirds. A variation of the same problem occurred in our own fabricating division. We had attempted to stack pallet loads of welding rod but found the extremely heavy loads were damaging the flux coatings of the rods in the lower piles. Pallet racks now limit the weight on the lower tiers to a point where no damage occurs.

Irregular shaped objects

In this application the physical shape of the loads prohibits safe stacking of one load on top of another. We have had many problems of this kind.

An excellent example is in one of our local refineries. The storage of large valves and other pipe line maintenance items had long been a housekeeping headache. These items either had to be stored outside with the re-

PALLET RACK used in order filling. Two lower tiers are accessible to the order filler. The top tier is used as reserved storage.

A PARTICULARLY large amount of space can be saved by storing irregularly shaped commodities on pallet racks. The storage of large valves and pipe line maintenance items in refineries has been greatly simplified through the use of this space saving equipment.

sulting rust, dirt and corrosion, or piled haphazardly together under cover. Pallet racks created enough space so all the goods could be stored under cover and still left them neatly arranged with all items accessible by fork truck.

Another example of this application was in a heavy hardware firm which was having trouble storing coils of wire. Three coils per pallet was the maximum safe height even though it resulted in only a 30-in. high pallet load. Here again racks solved the problem very satisfactorily by reducing the floor space requirement by two-thirds.

Again, in our own plant we had the problem of storing large trailer tires for use on finished products in our Oil Equipment Division. The safe height determined by our safety engineer was four tires. Pallet racks allow us to store 12 tires in the same amount of floor space.

Pallet selectivity

This is probably the most widely used pallet rack application. It occurs in any factory or distribution outlet which ships less than pallet loads. Common terminology for this is "order picking" or "filling." In this operation a portion of the pallets must be accessible to the order fillers walking in the aisles, and all pallets must be accessible to a fork truck. This is necessary to allow portions of any pallet load to be shipped as required.

Wholesale grocery warehouses have been making great strides in increasing the efficiency of their order filling operation by the use of pallet racks. We have furnished a large number of these installations in virtually every type of business which has the problem of shipping a wide variety of items in varying quantities.

Most of these installations have been three tier, i.e., one tier on the floor and two tiers in the racks. The top tier is used for surplus storage and the bottom two tiers for order filling.

If a storage problem falls in any of these three general categories, pallet racks should certainly be investigated to see if their use can't more efficiently utilize existing space, and do it at a fraction of the cost of additional space.

Pallet rack costs are difficult to predict, as the many variable factors involved such as quantity, pallet size, pallet load weight and height all contribute to the cost per pallet. However, we can try to give a cost idea by selecting an arbitrary "average condition." Assuming the storage area is devoted to single pallet loads, one pallet high with aisle space for fork truck operation, pallet racks can actually triple this usable space.

Let's assume our "average condition" involves 150 pallets 48 x 48 in., with a maximum load of 1,800 lb. each. The load height will allow three tiers of pallets. Fifty of these pallets will be stored on the floor. The remaining 100 will be on pallet racks above the 50 on the floor.

The complete installation of the racks, including erection, should not exceed $1,500. This means that for $1,500 you can store an additional 100 pallets in a space now containing only 50 at a unit cost of $15 per pallet.

A 48 x 48-in. pallet covers 16 sq. ft., so the space actually cost $.94 per square foot. Pretty economical space, isn't it? We feel qualified to say "yes" because we build the Butler Building, long recognized in industry as really economical floor space, but we have never been able to approach anything like $.94 per square foot for new building space.

Extra advantage

An added real advantage is the reduction in the range of the material handling operation. This is not so simple to attempt to place a dollar and cent value on, so we will not attempt to do so. However, bear in mind that our average condition will only require one-third the floor space with pallet racks as compared to the same number of pallets without racks. This means the interplant transportation distance has been reduced to a minimum. A considerable reduction in machine travel time and in man walking time is effected, both of which readily lend themselves to a more reasonable and economical operation.

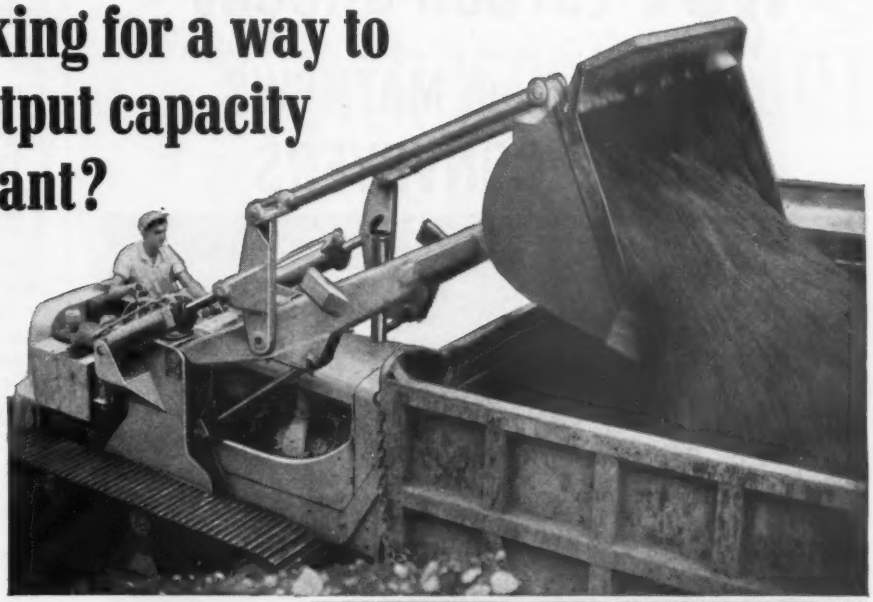
We would like to suggest a simple test in your own operation. Walk out into your warehouse and see how much air space you have between the tops of your existing storage piles and your building roof. Outside in the wide open spaces, air is a pretty cheap commodity, but under a warehouse roof it is too expensive a luxury to be tolerated.

Chemical bathtub

LOCKHEED Aircraft Corp. has installed a giant chromodize-iridite bathtub for coating large airframe parts. The new system has cut metal processing procedure time in half. Installation cost $165,000.

MR. PRODUCTION MANAGER:

are you looking for a way to feed more output capacity *into* your plant?



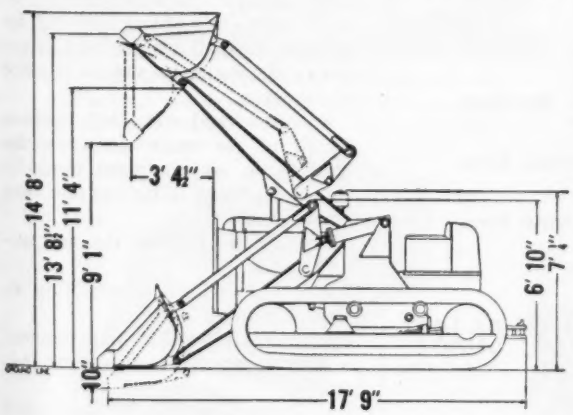
This Allis-Chalmers HD-9G Tractor Shovel might well be the answer. It offers the same outstanding versatility and performing ability as the 1-yd. HD-5G—the recognized standard of comparison—*plus* bigger capacity, higher reach and more power. With the HD-9G, one man can move more material per shift . . . handle a wider variety of jobs inside and out.

LOADS FAST WITH BIG TWO-YARD BUCKET

The HD-9G digs, stockpiles, loads trucks, feeds hoppers — handles any bulk material two big yards at a scoop. Special 3½-yd. light materials bucket almost doubles output in materials weighing not more than 1400 lb. per cu. yd. Exclusive Allis-Chalmers shift pattern further speeds loading by allowing operator to go from low forward to fast reverse with one simple gear shift.

HIGH DUMPING HEIGHT — 11 FT. 4 IN. UNDER BUCKET HINGE

Here is a Tractor Shovel that reaches for extra jobs. With bucket fully raised, it dumps into high bins. Also, tractor can work right up on storage piles, making it possible to put many more yards of material in a given area.



OVERALL WIDTH, 7' 11¼"

Ask your Allis-Chalmers dealer to show you the many ways this HD-9G has helped others step up production.

WORKS IN CLOSE QUARTERS — NO BULKY SUPERSTRUCTURE

Compact design, plus the ability to turn in its own track length, enables the HD-9G to work in confined areas or where there is little more than tractor-height headroom.

POWERFUL — 72 DRAWBAR HP.

The HD-9G has the power, weight and traction to handle tough excavating on new construction, maintain yard roads and parking lots, spot railroad cars, lift, carry, push or pull heavy loads of all kinds.

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TRACTOR DIVISION — MILWAUKEE 1, U. S. A.

HOT carbon anodes COOL OFF on MATHEWS CHAIN CONVEYERS

Part of cooling conveyer system which has reduced handling to a minimum at Kaiser Aluminum Company's Mead reduction plant.

In the highly specialized field of modern conveyer system work, there is no substitute for experience. In Mathews equipment you get that experience, plus the engineering resources and production facilities of a modern western plant. That's why we believe you get more for your money—better design—better performance—longer service—when you buy Mathews Conveyers. Write today for Bulletin 852. See how others, by application of the Mathews Conveyer System, have solved handling problems that might be similar to your own.

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Engineering Offices and Sales Agencies in Principal Western Cities

TANK TRUCK for caustic soda

INLAND Petroleum Transportation, Seattle, has just put into service a special tank truck for hauling liquid caustic soda from Tacoma throughout points in Washington and temporarily into Idaho.

The tank is made of 3/8-in. steel, is cigar-shaped and carries 90 lb. of pressure. It is the first in Washington and is to be used to haul to pulp mills, mines, and a number of smaller users such as brewers and bottlers.

The tank holds 3,300 gals., against 8,000 in a rail tank car. The cost rate is as high or higher than by rail, but the truck can get to places not on rail lines.

MECHANIZED loading for airlines

A PROPOSED "airdock" which would revolutionize present airline methods of loading and unloading passengers, baggage and cargo, has been designed by United Air Lines and is now under study for initial installation.

The proposed structure would be equipped with Whiting Loadair tracks, conveyor belts and other devices for mechanized loading and unloading of aircraft. The incoming plane would be taxied onto the tracks and towed to a predetermined position where supplies would be available.

The passengers would deplane directly into the second floor of the airdock, thus eliminating ramp stands and providing shelter in bad weather. By the time they walked to the baggage claiming counter on the first floor, their luggage—transported by conveyor belts—would be arriving for pick-up. Air mail, express and freight meanwhile would be swiftly handled by conveyor.

Refueled and reloaded without benefit of the many ramp vehicles currently in use, the plane would be ready for take-off in far less time than is now possible.

Primary features of the new airdock would be:

1. To protect passengers from inclement weather.
2. To sharply reduce time required to deliver baggage to deplaning passengers.
3. To provide greater safety and comfort for ramp employees.
4. To eliminate most of the vehicles now cluttering ramps.
5. To substantially reduce airplane ground time at stations.
6. To greatly add to manpower efficiency in servicing aircraft.

They gave a fork lift a "VOICE" and saved OVER $15,000 A YEAR!

Coordination increases efficiency. Dispatcher directs fork lift operators from Motorola base station console, coordinates operations and increases productive man and machine hours.

Uni-Channel mobile radio—serves as fixed or mobile station. Built-in "Permakay" filter eliminates 15 nuisance tuning adjustments, assures instant communications between Central Dispatcher and fork lift operators.

Leading Mfr.* cuts handling costs from 45¢ to 30.9¢ per load with

Motorola 2-way radio

Before installing Motorola 2-way radio, it cost this company 45¢ to handle each fork lift load. Immediately following installation of Motorola communications, cost per load fell 14.1¢. Figured on a 12-month basis, total savings amounted to $15,074.04—*a 500% return* on the initial investment of $3,038.54. In other words, Motorola radios paid for themselves in just 2½ months of use—*actually paid their own cost five times over in one year!*

Motorola makes it a *pleasure* for you to own and operate your own radio communications system. Eight exclusive Motorola improvements guarantee precision selectivity, durability and obsolescence-proof design. And, the exclusive "Permakay" filter eliminates 15 nuisance tuning adjustments.

Get the facts telling how Motorola pays for itself in direct savings. Let a friendly Motorola engineer in your vicinity give you the complete story.

**Company's name is in our files.*

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2-way Radio

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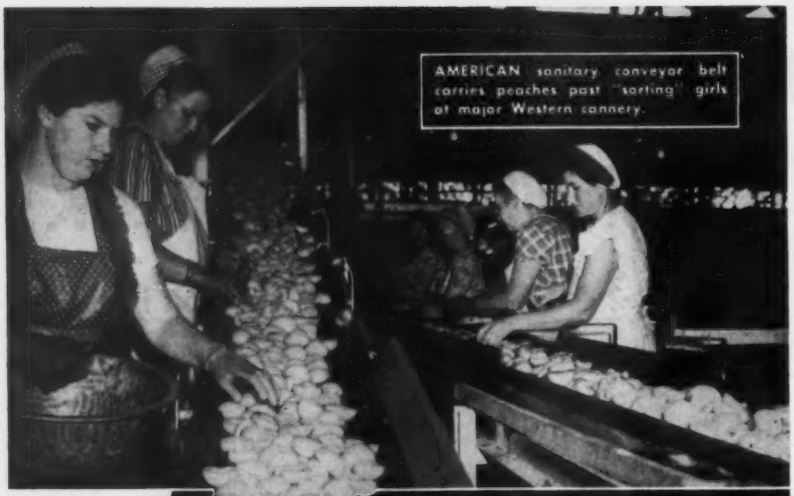

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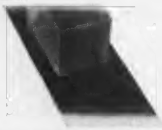
BELTING FOR EVERY PURPOSE

A. Raised center belt is extra thick in center for longer wear, better "cushion."

B. Cleated belt comes in straight cleat, open or closed "V" and chevron styles for hard-to-handle materials.



C. Package conveyor belt has rough top to grip smooth cartons, etc.

D. Elevator belts are tailored to your job conditions for longer service, lower cost.

Also flanged edge, grading, peach slicer, and other special application belts.

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•CANS •CARTONS
•BULK MATERIALS
•LIQUIDS

—Fluffy or Sticky
—Hot or Cold
—Light or Heavy
—Wet or Dry

It Will Pay You to CALL *American* FIRST

1. **QUICK ACTION.** At AMERICAN, you deal with top management, get quick action. The whole "works" is under one roof. No time-wasting departmental red tape, no cross country correspondence.
2. **HELP ON SPECIAL PROBLEMS.** "Specials" have been our meat since 1906. Chances are good we've already found the answer to *your* problem.
3. **CONVENIENT WESTERN LOCATION.** Everything needed to handle your belting job is right *here* in centrally-located Oakland!

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LOS ANGELES: 711 E. Gage Ave., ADams 1-9279
BOISE: 1116 No. 18th St., Phone 2612
ST. LOUIS: 843 So. Lindbergh Blvd., WYndom 2226

CLOSE TEAMWORK makes freightline tick

GARRETT Freightlines, Inc., of Pocatello, Idaho, has established a basic three point system, integrated with close teamwork between management and personnel to account for smooth and effective operations.

The three factors are: (1) teletype communication; (2) a claims processing system; (3) a central checking system on the dock.

Considering the multitude of questions and problems vital to shippers which arise daily, Garrett has found that the most practical and economical way to coordinate information is through station-to-station teletype. Three leased wires from the Pocatello headquarters terminal are involved. One circuit goes to Portland, one to Berkeley, and one to Los Angeles. Each line has substations so that every terminal is in contact with Pocatello during the 8-hr. operating day.

Any customer with a problem that the station agent cannot answer forwards the problem to headquarters, where the answer is found and the agent immediately notified.

Solicitors can inform shippers of the exact shipment date. This accurate timing enables shippers to reduce spoilage of perishable goods by allowing them to plan special unloading or storage facilities.

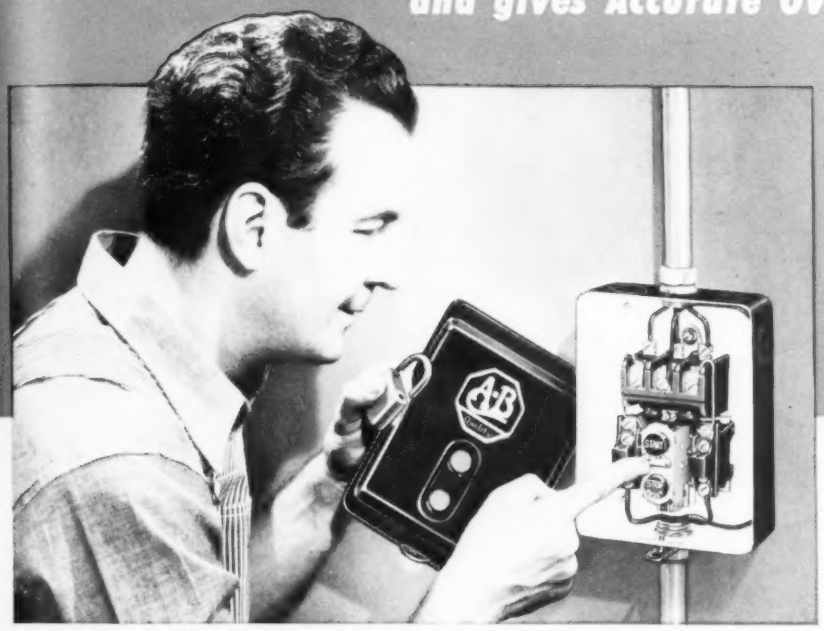
The chief dispatcher can plan driver schedules so that the driver will spend the fewest possible hours away from home. The system also facilitates coordinated scheduling of runs so that a minimum of time is used on idle equipment.

Garrett's claim prevention program has proved equally effective, showing a steady decline in the claims ratio with respect to gross revenue. A new processing system assures customers of record handling on claims, with over 75% being processed either for payment or declination in a 30-day period.

Cameras have been used to reveal improper loading. When a station receives an improper load, pictures are taken and sent back to the load's point of origin. Blame is then placed accurately on the men responsible. This company goes on the assumption that the secret of claim-free transportation is not in paying the claim after it is received, but in preventing a claim from developing.

Proof that this program has been effective is shown by the fact that the company was one of seven carriers in the entire industry receiving outstanding recognition from the American Trucking Associations, Inc., for its 1951 claims prevention program.

A MANUAL MOTOR STARTER
that's Push Button Operated...
and gives Accurate Overload Protection



Maintenance man is locking stop button in OFF position before padlocking cabinet cover. All Bulletin 609 Manual Starters have this safety first feature. It protects man, motor, and machine.

For Single and 3 Phase Motors up to 5 hp, 220 v; 7½ hp, 440-550 v

Bulletin 609 Switch with arc hood raised to show three double break, silver alloy contacts.

Bulletin 609 Starters have a quick make, quick break switch mechanism that is actuated manually with two push buttons. Two accurate overload breakers automatically open the switch in case of sustained overload.

The double break, silver alloy contacts require no cleaning, filing, or dressing. Bonderized pressed steel cabinets resist rust under ordinary plant conditions. For damp or dusty places the special cabinets, shown below, assure long, trouble free life. Millions of Bulletin 609's are in daily use. Write for bulletin.

5-53-M

Available in enclosures for every type of service

Allen-Bradley Co.
1316 S. Second Street
Milwaukee 4, Wis.

A-B Quality

ALLEN-BRADLEY

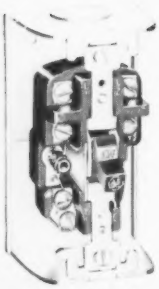
BULLETIN 609 MANUAL MOTOR STARTERS

QUALITY

Standard toggle lever switch

Key operated for added safety

Linkage lever switch



Form 51-52 with cover off

Form 51-52 with pilot light

Close-up of Bulletin 600 switch mechanism, showing thermal overload breaker. These switches are available with one or two poles.

In watertight enclosure

For hazardous gas locations

Fits flush switch box

Fits handy switch box

A BIG LINE OF SMALL STARTING SWITCHES

with Overload Protection for Motors up to 1 hp

The Bulletin 600 Starting Switch gives overload protection to small a-c and d-c motors on unit heaters, stokers, fans, compressors, and small electric tools. It is a popular and fast selling starting switch.

The overload breaker automatically trips the switch in case of sustained overload. The switch cannot be held closed until the overload on the motor is cleared.

To reset the overload breaker, the switch lever is moved to OFF position. The motor can then be restarted by moving the switch lever to the ON position. Therefore, no time is wasted replacing fuses.

Bulletin 600 Starting Switches are available in many forms of enclosures, a few of which are shown above. For complete data please send for illustrated Bulletin 600, today.

Allen-Bradley Co., 1316 S. Second St., Milwaukee 4, Wis.

Form 72 unit with selector switch

Form 62 watertight enclosure with pilot light

ALLEN-BRADLEY

BULLETIN 600 STARTING SWITCHES

QUALITY

A-B Quality

5-53-M

ALL REQUESTS for material shipments are sent directly to the dispatcher who records data on his log and makes the call.

TWO-WAY RADIO EXPEDITES MATERIAL MOVEMENT AT FONTANA

Simplifies switching, minimizes deadhead travel and non-productive time of engines

By
JOHN CULLEN
Superintendent Yards, Roads and Transportation Department
Kaiser Steel Corp.

MOVEMENT of raw materials and finished products within Kaiser Steel's huge, sprawling, 1,600-acre Fontana, Calif., mill proceeds quickly and unerringly under the direction of a modern two-way radio communications system.

This material transfer, handled over 55 miles of standard-gauge railroad track strung around the mill area and through plant buildings, is one of the most important phases in the operation of this fully integrated West Coast steel mill. When the hungry mouths of the blast furnaces empty, freight cars laden with iron ore from the company's Eagle Mountain mine must be standing by. Schedules in this vast operation must be kept. Delays are far too costly.

To coordinate and speed the movement of materials, Kaiser Steel has installed two-way radio on all company-owned diesel locomotives operating in the mill area. These diesel locomotives receive instantaneous orders directly from a central dispatcher.

Volume of traffic

All raw materials—including iron ore, coking coal, limestone, dolomite, manganese, fluorspar and scrap iron—are shipped to the mill over lines of the Southern Pacific and Santa Fe railroads. These lines extend to mill sidings, or "interchange yards," where all

KAISER STEEL'S Fontana mill handles over 75,000 tons of finished steel and by-products totaling about 8,000 cars per month.

THE YARDMASTER'S truck is equipped with a 10-watt dash mounted mobile unit operating on 152.87 megacycles.

cars are picked up, classified, routed, weighed and delivered by the diesel locomotives of the Yards, Roads and Transportation Department.

Incoming cars of raw materials and outgoing shipments of over 75,000 tons of finished and semi-finished steel and by-products total approximately 8,000 cars per month. Multiple weighings, routing, timing, etc., often require an incoming car to be moved as many as sixty times before reaching its final destination.

A car of finished or semi-finished products is often moved eight times before it is finally ready for shipment. For example, if it is required to deliver the fifth car on a siding, five cars have to be moved ahead and four moved back in addition to moving the desired car to its destination. This involves movement of ten cars in order to route one.

Considering the fact that thousands of cars a month enter and leave the mill, in addition to the internal transportation of partially processed products within the mill, movement of material appears to be a superhuman job. It isn't, however, with a well planned, up-to-date two-way radio dispatching system.

Radio system

The radio system used by Kaiser Steel is classified as a "special industrial" installation and licensed to operate by the Federal Communications Commission on a frequency of 152.87 megacycles. The system includes 12 radio-equipped diesel locomotives which have direct radio contact with three base stations. The first base station is located in the yardmaster's office, the second at the ingot scales and the third in the open hearth pit office. Also radio-equipped are the yardmaster's pick-up truck, a general maintenance truck and a track maintenance truck.

Installed on the diesel locomotives are 30-watt Motorola railroad radio units especially designed to withstand the rugged treatment of railroad operation. Special shock-mounted racks house the individual transmitter, receiver and power supply units and protect them from excessive shock and vibration. The individual plug-in transmitter, receiver and power supply units are each contained in a separate housing within the rack so that units may be removed or interchanged with other units and thereby simplify system maintenance. Installed beside the engineer are a control head and handset. The handset is similar to the standard telephone handset, except that it incorporates a push-to-talk button which is pressed when transmitting. Controls for radio operation and volume adjustment are located on the control head.

Base station

The base station in the yardmaster's dispatching office is the same type of unit as is used on the locomotives except that it uses a 117-v. AC power supply.

A complete railroad radio installation is set aside as a spare to facilitate quick servicing of any defective unit. It is only necessary to pull out the defective unit and plug in the spare.

The base stations at the ingot scales and in the open hearth pit office are Motorola 10-watt AC Uni-Channel units. These units permit direct radio contact between the foreman and the diesel locomotives moving materials within the buildings.

The yardmaster's truck, the general maintenance truck and the track maintenance truck use 10-watt dash-mounted mobile units. These units also operate on the 152.87 megacycle frequency.

Dispatching

All requests for material shipments are sent directly to the central dispatcher at the yardmaster's office. When the order is received, all pertinent information concerning the shipment is recorded on the dispatcher's daily log sheet. This information includes the time the order was received, the number of the department ordering material, the order number, accounting code, job number, content and the number of cars involved.

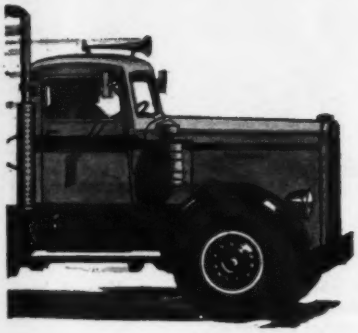
With this information before him the dispatcher goes on the air with—"Yardmaster to 1104 . . . switch on 812W . . . pick up 2 steel 808 to 744 . . . 2 scrap 808 to open hearth . . ."

Receipt of the transmission is immediately acknowledged. When the job is completed, the engineer calls the yardmaster who in turn makes a "time completed" entry in the log.

The short, concise interchange of orders with diesel locomotive 1104 is instantaneous—no time is lost in getting the job done. Before radio, this same two-minute operation required

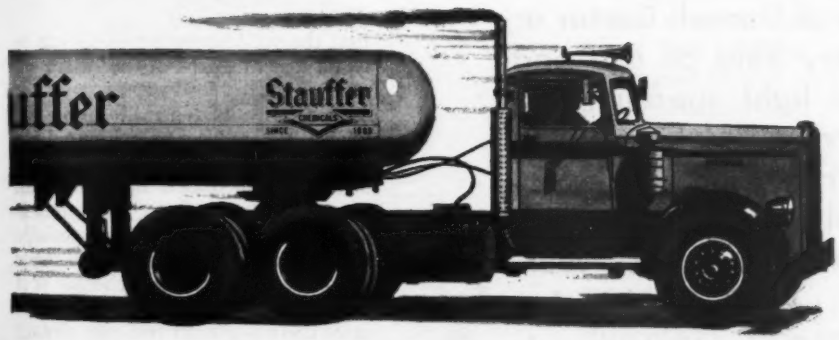
A THIRTY WATT Motorola railroad unit is especially designed to withstand the shock and vibration to be found in railroad operation. Units may be removed or interchanged with other units simplifying the maintenance system.

Acids! FOR FAST SERVICE, CALL STAUFFER!



Wherever you may be located in the West, you can depend on the fleet of Stauffer tank trucks to speed your order of industrial acids to your plant. In any quantity, at any time—call STAUFFER for all your industrial acid needs!

- ***Muriatic Acid***
- ***Nitric Acid***
- ***Sulphuric Acid***



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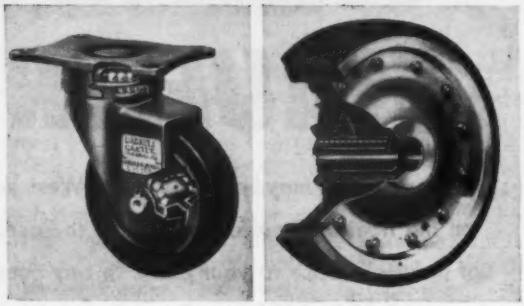
& E-Z ROLL WHEELS



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A SMALL and compact 30-watt base station hangs on the wall at the dispatcher's quarters.

that the yardmaster get in his car or go on foot in search of the switch engine.

Since only its general location was known, this process of tracking down the switch engine to pass on the orders often required from a half hour to an hour. This arrangement led to inflexibility in operation, and was especially time-consuming if changes were made in a previously arranged schedule or if rush deliveries had to be made. With radio there is instant two-way contact regardless of where the engine may be working.

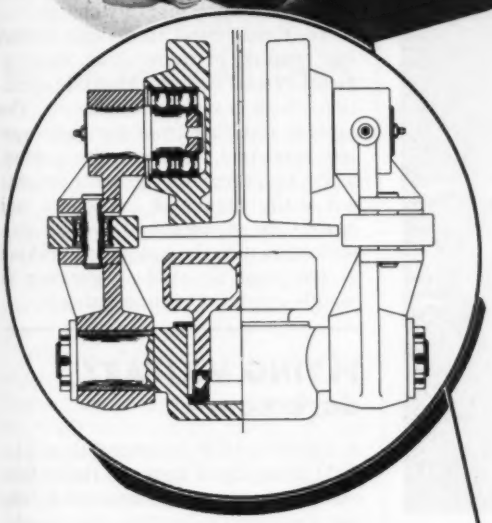
One of the greatest time savers resulting from radio was brought about by the elimination of needless deadhead travel. In selecting the switch engine for a particular job, the yardmaster can now choose the one located closest to the cars to be moved, eliminating unnecessary travel time.

Or, if a switch engine has completed a job and is standing by for orders, the engineer can call the yardmaster for his next assignment and proceed immediately without any loss of time. This is especially important, since any delay whatsoever ties up expensive capital equipment and greatly reduces material handling capacity. Non-productive time is now cut to an absolute minimum.

Track maintenance

The use of radio has proved invaluable in speeding maintenance operations. Because of the nature of the operation, locomotives are often derailed as they pass over the slag dump. Naturally, radio has been unable to prevent these derailments, but it has

INDUSTRY DEMANDS IT



The flexibility of an underhung crane system and the ruggedness of a top riding unit, both are achieved in the new CHECO TRAM CHIEF Underhung Crane System—an engineered design—universal in application and priced to meet any plant budget.

Compare these CHECO TRAM CHIEF features:

CAPACITY—Up to 15 tons.

RUNWAYS AND BRIDGE GIRDERS—Standard mill run silicon steel (195 ave. Brinell hardness) insures higher strength at lower cost.

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EVEN LOAD DISTRIBUTION—assured by self aligning side plates and thrust bearings.

DRIVE—Fluid or variable speed through single or dual semi-pneumatic tires, gives maximum traction and smooth acceleration.

CHECO TRAM CHIEF Crane Systems are universal in application. No special track is required, CHECO carrier heads with integrated ratings will meet your exact needs. Complete plant coverage is available with our standard factory built systems. Consult our engineering department regarding your specific crane problem.

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CHAINVEYOR PAT. PEND. NOW..

...for the first time AT LOW COST!

A QUALITY—Light Capacity—Fully Enclosed, Continuous Powered—Overhead Conveyor developed and tested over a period of years, Chainveyor represents a radical departure from conventional design. Metallurgical research and inventive engineering have succeeded in reducing bulk and weight and, at the same time, provided a rugged, long lived conveyor at an extremely low cost.

FEATURES:

- ★ **CAPACITY**—30# per pendant on 6" centers. Individual loads up to 120# when supported with cross bar attachment. Chain pull up to 400# each power unit.
- ★ **SIMPLICITY**—Engineered to eliminate complicated, fast-wearing parts. Chainveyor is revolutionary in simplicity of design.
- ★ **EASY TO INSTALL**—Use of tubing materially reduces weight of tract required for a given load. As a result, less support is required, installation is simplified and far less expensive.
- ★ **TRACK**—1⅝"x ⅛" slotted steel tube easily installed with minimum support.
- ★ **CHAIN**—Full ball bearing wheels mounted on steel side links, heat-treated for long life.
- ★ **CURVES**—Heat-treated for long life—15" radius provides extreme flexibility.
- ★ **TAKE-UP**—Adjustable spring take-up automatically maintains uniform chain tension.
- ★ **VARI SPEED DRIVE**—Positive sprocket tooth drive with easily replaceable shear pin protection.

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Engineering Offices in all Principal Cities

If your conveyor requirement falls within its capacity—INVESTIGATE CHAINVEYOR. It is truly revolutionary in the materials handling field. Write today for full information. Dept. K.

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UNITED STATES SPRING & BUMPER CO.

4951 Alcoa, Box 2475 Terminal Annex

Los Angeles 58, California

cut out-of-service time considerably. Now the engineer simply picks up the handset and calls the track maintenance truck. Within minutes the engine is back on the track and in operation.

Now engineers even call the maintenance truck to repair such things as windshield wipers and sanders.

Safety

Since the installation of radio, accidents in the movement of material have been drastically cut. Previously fog had been a particular menace. Now it is possible to know the exact location and movement of all locomotives and thereby minimize accidents.

The maintenance of the radio system is the responsibility of a Motorola Service Station located nearby. All maintenance including periodic checks, replacement parts and labor are provided for a small monthly charge.

To Kaiser Steel, the radio system has resulted in tremendous improvements in their material handling operation—both in speed and economy. The savings resulting from the radio system soon pay for the entire system. Then, too, there are the other benefits not easily expressed in dollars and cents. The advantage of over-all simplification with the equipment working in the most economical sequence is readily apparent to those using it.

FLYING MILITARY darkroom

A CONTRACT for more than $1,000,000 worth of airborne trailer laboratories has just been awarded by the Air Force to Trailmobile, Inc., a subsidiary of Pullman, Inc. The air-transportable trailers can be backed up to the wide clam shell doors of the Air Force's huge C-119 cargo planes. These trailers then slide off their chassis and are swallowed up inside the plane complete with their cargo and equipment.

Four of these trailers grouped together will form a complete Air Force photographic processing laboratory, designed for operating in front line areas near combat zones.

Each of the semi-trailers will be equipped for one special function, such as processing, printing or interpretation. Each four-trailer laboratory will be capable of developing and printing thousands of military aerial photographs every day. The operation will save time required to transport the undeveloped negatives far behind the front lines, with the result that finished prints will be readily available to the front lines.

ABOUT $750 worth of special equipment was required to convert this Chevrolet 1½-ton flat bed truck into an engine pulling boom truck. The electrically operated boom can handle 3 to 5 tons.

HEAVY ENGINES MOVED by special Boom Truck

NOTICING the valuable time and effort spent in removing and reinstalling engines in oil field and farm installations, Rutter Armey designed himself an electrically operated boom truck which cuts a minimum of 2 hr. plus the services of one man from the average time required to pull or install one of these heavy engines.

With the use of this electrically operated boom truck, Rutter Armey Bearing and Machine Works of Fresno, California, has set up an efficient engine pulling service that cuts operation costs in its engine rebuilding plant and at the same time reduces the cost to farmers and others requiring this type of service.

Efficiency required

With the majority of the pulling or installing work being done in the field, it was discovered that an efficient and versatile piece of equipment was needed for handling the heavy engines. After several weeks of research and development work plans for the truck's construction were completed.

A one and a half ton Chevrolet truck, with the bed and frame reinforced with ⅜-in. channel iron to reduce springing under load, was chosen and a boom was installed near the center of the flatbed. To give the boom double load capacity, 3-in. H-beams were placed directly beneath it. Overload springs were installed and heavy tires with a load capacity of 1,700 lb. each were used.

Telescoping jacks are mounted on each side of the back of the truck to absorb the load's initial jolt. When the

JUST OFF THE PRESS ...and FREE!

What it Contains

- Complete Caster recommendations for industries, institutions, etc. using mobile equipment.
- Complete listing of all type wheels for floor and load conditions.
- Complete presentation of Casters engineered for
  1. Light Duty
  2. Medium Duty
  3. Heavy Duty Work
  4. Special Duty Work
- Industry's most complete line of DOUBLE BALL BEARING SWIVEL Casters backed by over 60 years of engineering experience.
- Patented Double-Spring Action Casters that absorb bounce and jounce, have *interchangeable standard wheels*, swivel regardless of over-load.
- 80 pages of data to help solve your materials handling problems.

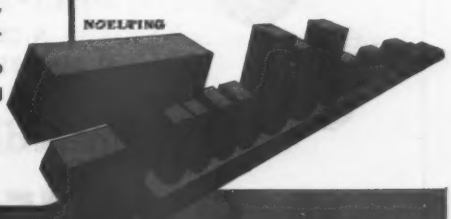
YOUR GUIDE TO SOLVING MATERIALS HANDLING PROBLEMS!

To help you with your handling problems . . . loads, floor surfaces, types of wheels . . . you should have Faultless Caster Catalog 157.

Selection tables, recommendations of correct type casters for specific equipment, what wheel constructions are best under certain circumstances—and much related engineering data are clearly given in Catalog 157.

In addition, you will find descriptions, illustrations and specifications on the most complete line of Double Ball Bearing Swivel and Rigid Casters ever supplied to industry.

Catalog 157, requested on company letterhead, is yours for the asking. And so are the services of our engineering staff—for special problems—without obligation.



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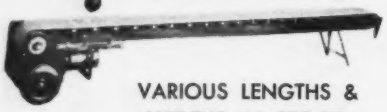

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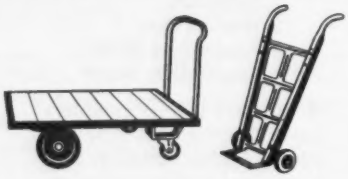
ALL TYPES AND CAPACITIES

SPECIAL TRUCKS FABRICATED IN OUR SHOP



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M. E. CANFIELD CO.

419 E. 3RD STREET — LOS ANGELES 13

load is properly distributed the jacks are retracted.

Working mechanisms used in connection with the boom are located under the bed of the truck allowing maximum space for transporting engines. This mechanism consists of three electric motors, two winches, and a series of sprockets and chains.

The boom is controlled by three direct-current electric motors, each of which can be made to run either clockwise or counterclockwise. One motor raises or lowers the boom, a second controls the hauling line, and the third rotates the boom about its base.

The power for the motors is furnished by a 12-volt wet-cell battery with a capacity of 245 ampere-hrs. The battery is charged by a generator on the truck engine at the rate of approximately 40 ampere-hours. The boom can handle 3 to 5 tons on a 6-ton cable at the rate of 3½ ft. per min.

About $750 for materials and 400 hrs. of labor were required for the construction of this equipment. The cost of operation has been cut down considerably over the old method which used 2 men, a pickup, and a rented A-frame truck equipped with winch and additional engine pulling equipment.

VERSATILE HOIST
hitch to overhead door

ANOTHER USE for an electric chain hoist has been found by D. H. Loosli of Idaho Falls, Idaho, who hitches it to a two-section overhead door for Quonsets, warehouses and shops. It can be used entirely for pulling up the door, or can be fitted on a track so that it performs all the ordinary hoist duties. The virtue of doors so controlled, according to Mr. Loosli, is not only the ease of raising and lowering, but also the fact that they can be made much tighter than other overhead doors.

NEW ALUMINUM
movie reel

IN THREE-DIMENSIONAL film projection the extra weight of the film involved in ordinary reels can lead to serious damage of the films and impose an overload on projection equipment.

Del-Air Products, Los Angeles, has solved this by developing the "Free Flo" hub reel. The reel is much larger than ordinary reels and the center spins freely while the outside frame, being a separate unit, turns more slowly and simply acts as a holder to keep the film in place.

Here's proof . . .

BUTLER steel pallet racks store *twice as much* in the same space

Before . . .

Forty-eight pallets of groceries, arranged in three rows, were stored in this floor space. To get at a pallet of groceries in the center row, with a fork truck, it was necessary to move the neighboring pallet on the outside row.

After . . .

Installation of *Butler* pallet racks made it possible to store *twice as many* pallets—96 in all—in the *same* warehouse space. Butler pallet racks put 64 of these pallets within easy arm's reach of the order fillers. Any one of the 96 pallets can be moved with a fork truck *without disturbing* its neighbors.

You can save time and space by using Butler steel pallet racks in any warehouse where quick access to a variety of products is desirable. Butler materials handling engineers can help you solve your special warehousing problems. Write for full information, today!

BUTLER MANUFACTURING COMPANY

Dept. 72-A, P. O. Box 1072, Richmond, California

SAFE TRANSIT TESTING SHAVES BOXING COSTS

20 manufacturers of gas appliances submit packages to tests

IN ORDER to reduce shipping losses and obtain certification of their products from the National Safe Transit Committee of Washington, D. C., 20 manufacturers of gas appliances have submitted their packaged products for damage testing at the Pacific Coast Branch Laboratories of the American Gas Association, Los Angeles, Calif.

This program uses testing equipment located within the gas industry. The program was initiated at the express desire of members of the manufacturing section of the Pacific Gas Association. All tests are in accordance with the established procedures of the National Safe Transit Committee and are conducted on an impartial basis.

The testing equipment includes an L. A. B. Package Tester (vibration tests), a Conbur Incline testing device (impact tests), an Acme Drop Tester (for packages under 100 lbs. in weight), and an R-S Two-Way Ride Recorder for recording both longitudinal and vertical impacts on products being tested.

GAS-FIRED forced-air furnace being subjected to impact test on a Conbur incline testing device. An R-S two-way ride recorder is mounted on the furnace during test for recording impact on products.

Test cycle

For packaged products weighing 100 to 1,000 lbs. when prepared for transportation, the test cycle consists of a vibration test and an impact test.

For both single and multiple packaged products weighing under 100 lbs. when prepared for transportation, the test cycle consists of a vibration test and a drop test.

To date 20 manufacturers of gas burning appliances have submitted 151 packaged products for tests. These products vary in weight from 3 to 808 lbs. They included gas ranges, gas-fired forced-air furnaces, gas-fired floor

Hi DUTY TRANSITER FORK TRUCKS

Now Available with WAUKESHA ENGINES and 58" *FREE LIFT* in 1,000 - 2,000 - 2,500 - 3,000 lb. capacities

Check these reasons why Hi DUTY FORK TRUCKS work for LESS!

DUAL LEVER CONTROLS allow accurate hoist and tilt, with finger-tip control. Controls are in a natural location on the right hand side of the operator.

NEW YOKE SUSPENSION on rear wheel. Heavier, more rugged construction will stand the often imposed "excess load."

FAMOUS HYDROFLEX CLUTCH is exclusive on all Hi DUTY models. It's the smoothest operating, longest lasting and most readily accessible clutch mechanism available to lift truck users. HYDROFLEX is a LIFT TRUCK CLUTCH. Hydraulically actuated, it provides continuous operation without lubrication, adjustment or repair.

LOWEST OPERATING COST—Average gas consumption has been found to be less than any other truck.

LOWEST MAINTENANCE COST—Few parts to wear . . . all parts are readily accessible, meaning one-third less "down time" when repairs are required.

WAUKESHA ENGINES have been incorporated in the new Hi DUTY 100 FLW, 200 FLW, 250 FLW and 300 FLW fork lift trucks. The Waukesha ICK four-cylinder engine is specially suited for fork lift trucks!

Hi DUTY'S NEW FREE LIFT feature means this truck can work for you under low overhead clearances, inside freight trucks, rail cars, and elevators. FREE LIFT lets you lift the load as high as 4' 10" before the mast moves. Forks will raise to top of mast . . . mast stays down!

Get the facts today! Write or call for literature and specifications.

W. T. BILLARD INC.

SOUTHERN CALIFORNIA DISTRIBUTOR

734 E. 3rd St. LOS ANGELES 13, CALIF. Michigan 2659

A CRATED gas-fired forced air furnace is being subjected to vibration tests on an L. A. B. package testing machine.

furnaces, gas-fired recessed heaters, gas-fired clothes dryers, evaporative coolers, automatic storage gas water heaters, combination gas hot plates, electrical refrigerators, enameled parts for domestic ranges, and parts for forced-air furnaces. Testing results show that the packaged products of five companies have complied with the applicable test procedures of the National Safe Transit Committee and have been recommended for certification.

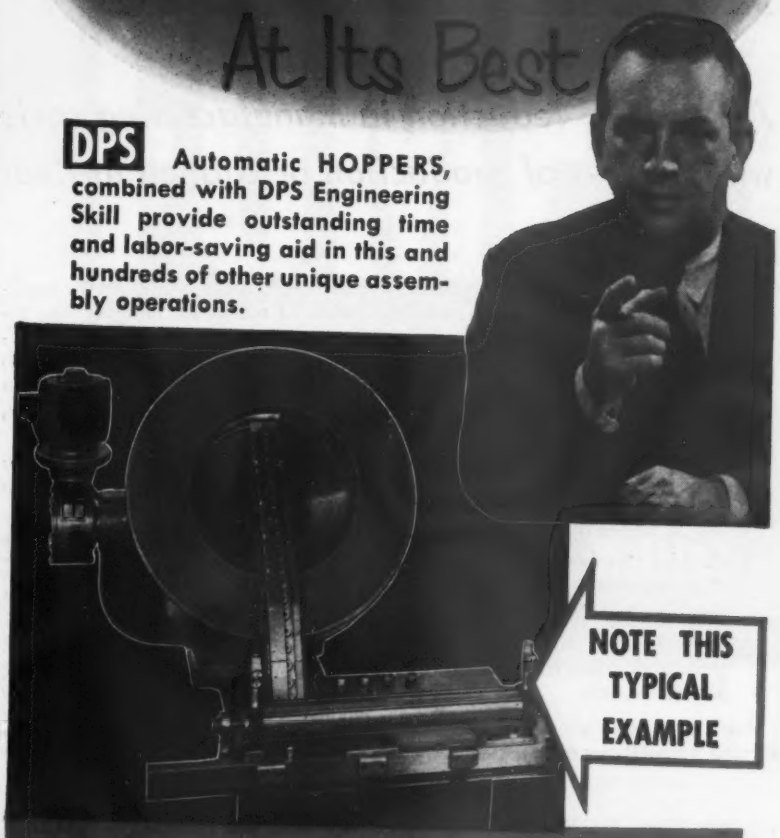
Benefits

The program has been of great service to West Coast manufacturers of gas burning appliances. One manufacturer in the program stated that he was able to modify the crating of his water heaters in such a way that he will realize a saving of approximately $10,000 per year on this single product.

THIS UNUSUAL looking device is poised in preparation for drop testing. The machine is an Acme Drop Tester. (Capacity 100 lbs.)

Here's AUTOMATION At Its Best

DPS Automatic HOPPERS, combined with DPS Engineering Skill provide outstanding time and labor-saving aid in this and hundreds of other unique assembly operations.



NOTE THIS TYPICAL EXAMPLE

Above is shown motorized hopper and transfer mechanism whereby eight (8) valve retainers are selected, oriented and transferred out to proper spacing and dropped over eight (8) valve stems simultaneously, and BELIEVE IT OR NOT, ALL THIS IN ONLY FOUR SECONDS! . . . This unit is used as a part of a special machine developed for the semi-automatic assembly of valves in V-8 MOTORS . . . just one of innumerable applications where DPS Motorized Hoppers, Power Screwdrivers and other Assembly Aids are conserving valuable production time in thousands of plants.

CONTACT SALES ENGINEERS IN YOUR AREA—OR WRITE FACTORY DIRECT—

LOS ANGELES 26, Burklyn Co. 3429 Glendale Blvd.
BAY AREA H. E. Linney Co. 5801 College Ave., Oakland 18, Calif.
PORTLAND, ORE., SEATTLE and SPOKANE, WASH. Machinery & Tool Supply Co., Inc. 417 First Ave., So., Spokane 8, Wash.

LESS WASTE TIME, LESS LABOR, LESS COST!

DETROIT POWER SCREWDRIVER CO.

2801 W. FORT ST. Dept. F **DETROIT 16, MICH.**

ADVANTAGES OF AUTOMATIC CASING

By
S. E. PERKINS*
Chairman
Material Handling Division
San Francisco Section
American Society of Mechanical Engineers

Analysis of reduction in manufacturing costs without loss of production or change in floor space

PACKAGING operations include several individual steps, namely:

1. Preparation or set-up of package prior to filling operation.
2. Package filling by weight or volume.
3. Check-weighing, if required.
4. Package closing or sealing.
5. Package overwrapping or labeling, as required.
6. Packing finished packages into shipping cases.
7. Sealing filled shipping cases.
8. Loading filled shipping cases on pallets, or conveying directly to storage or cars.

Each step listed above may be performed manually or automatically by machine. When considering the application of machines, however, the investment in equipment should be studied from the standpoint of the justification for the capital expenditure. The followng may be suitable justifications, depending upon conditions:

a. Maintenance of close uniformity of packaging results, not obtainable with manual operations.

b. Increase of production without increase in floor space or personnel by changing from manual operations to machine operations.

c. Reduction in manufacturing costs, at the same time maintaining current volume of production without change in floor area allocation.

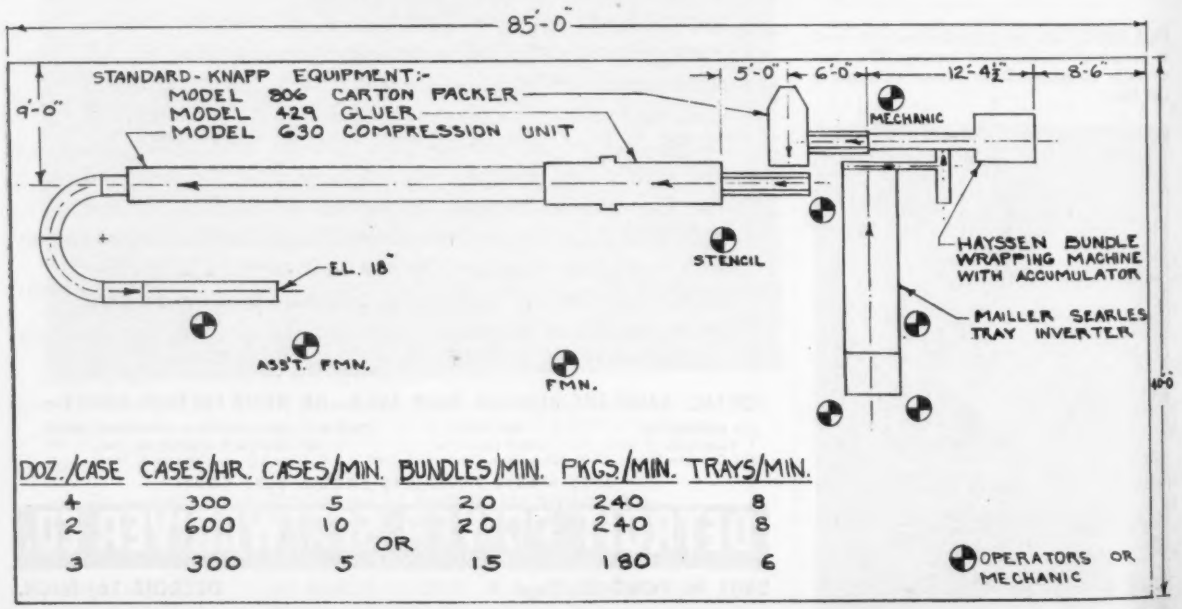
As an example of production-cost analysis we shall analyze justification "c" (reduction in manufacturing costs) as applied to operation 6 (packing finished packages into shipping cases).

In one branch of the food industry which has grown rapidly in the last five years, several companies have become outstanding in their yearly production and their well-rounded operations to cover at least ten of the 12 months in the year. However, the hundreds of thousands of retail size packages are still being packed into shipping cases manually. These packages are of the rectangular, paper-carton type.

Also, shipping cases that are now

*Sales Engineer, Mailler Searles, Inc., San Francisco.

Example of an automatic casing layout



DOZ./CASE	CASES/HR.	CASES/MIN.	BUNDLES/MIN.	PKGS./MIN.	TRAYS/MIN.
4	300	5	20	240	8
2	600	10	20	240	8
		OR			
3	300	5	15	180	6

SCALE: ⅛"=1'-0"

specially formulated to resist acid, alkali and sulphide fumes

FUMEX
the fume resistant
WHITE enamel
that stays WHITE!
ACID TEST
Discs are placed face down over beaker of concentrated Hydrochloric Acid for 24 hours.
ALKALI TEST
Discs are placed face down over beaker of concentrated Ammonium Hydroxide for 24 hours.
SULFIDE TEST
Discs are placed face down over beaker of concentrated Ammonium Sulfide for 24 hours.
FUME RESISTING ENAMEL A
FUME RESISTING ENAMEL B
FUMEX

Fumex is most resistant to acid, alkali, sulfide and chlorine fumes with minimum of fading and reaction (see test proofs on photos).

For interior surfaces only . . . for brick, concrete, plaster, wood, metal. All surfaces to be treated first with Fumex undercoater.

White only . . . supplied in semi-gloss finish.

Washable . . . withstands washings at regular intervals.

Application . . . by brush or spray.

A. C. HORN CO., Inc.

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Manufacturers of materials for building maintenance and construction
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A. C. HORN COMPANY, INC.,
San Francisco 7, Calif.

Please send me ☐ complete data on FUMEX

☐ free copy of your 106-page Construction Data Handbook

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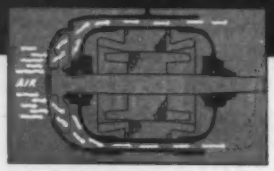
Let These
MOTORS
Do Your
DIRTY WORK

They're built to ignore dirt, dust and corrosive vapors



SMITHway totally enclosed fan-cooled motor—a frame within a frame and both are cast iron. Efficient, high-capacity, double-locked fan forces air through self-cleaning ducts. Heat is dissipated—dirt, dust and corrosive vapors can't get into the sealed motor.

CAST IRON construction is one of the many outstanding features which makes these motors superior under service conditions involving dirt, dust and corrosion. Cast iron frame, cast iron end bells—the complete enclosure is cast iron—all exposed parts are cast iron. Ideal for petroleum, chemical and other rugged industrial applications.
SMITHway totally enclosed fan-cooled motors are built to standard NEMA frames to meet the highest standards of electrical performance. TEFC motors are built in sizes from 5 to 125 HP. Parts and service available throughout U.S.A. Get complete information from nearest office or write today.

SMITHway totally enclosed non-ventilated motor. Standard NEMA frames. Cast iron construction of all exposed parts keeps these motors, by the thousands, on the job regardless of dust, dirt and corrosive conditions. Available in ratings from 1 to 5 HP.

A.O.Smith
ELECTRIC MOTORS

PACIFIC COAST DIVISION—5715 SMITHway Street, Los Angeles 22, California
INTERNATIONAL DIVISION—Milwaukee 1, Wisconsin
Offices—Stock Exchange Bldg., 155 Sansome St., San Francisco 4; White Bldg., 1338 Fourth Ave., Seattle 1; P. O. Box 1721, Boise; 930 17th St., Rm. 501, Denver 2.

used are of various dimensions, depending on pack arrangement, and will contain either one dozen or two dozen packages depending on the customer's instructions.

It would seem that bundling and carton packing machines, both of which are available and have been proven in actual industrial operations, would be applicable to the project under study.

Study the situation

The first step, then, is to study the plant production rate and compare it with the capacity of available equipment. It may then be determined how much and what type of equipment will be required.

Second step is to study the method of packing the cases. The assumption is made that the use of a four-dozen case, containing four bundles of one dozen packages per bundle, will be less costly than the present use of one-dozen and two-dozen cases. The arrangement of the packages in the bundle and the bundles in the shipping case will be determined by exchange of information between the representative of the equipment manufacturer and the plant management.

Third step is to prepare a tentative floor plan to scale, showing the proposed arrangement of equipment, floor space required and operators required. Also, on this floor plan a tabulation of the sizes of packages, bundles and cases, together with packing arrangement, may be shown. Such a floor plan is presented here, identified as Plan "D."

Estimating installed cost

The fourth step is to estimate the installed cost of the proposed equipment. For Plan D this is calculated as follows:

Cost of equipment	$19,465.00
10% for installation	1,946.50
5% for freight	973.25
3% for state sales tax	583.35
Approximately 10% for contingencies	2,031.90
Estimated installed cost	$25,000.00

Fifteen per cent of this estimated installed cost of $25,000, or $3,750, must be included in the annual charge to machine operations, for annual equipment burden, consisting of depreciation, interest on the investment, maintenance, power and taxes.

Fifth step is to determine the direct labor costs with and without the use of the proposed equipment. These figures will be based on the number of people required for the various operations and the number of shifts required per year. Premium pay for overtime must be included, if required, as well

TABULAR ANALYSIS OF ESTIMATED SAVINGS AND RETURN ON AUTOMATIC CASING

Item	*Present hand casing operations in 1-doz. cases	*Present hand casing operations in 2-doz. cases	Proposed machine casing operations with 1-doz. bundles in 4-doz. cases
Total yearly production in dozen packages	1,600,000	1,600,000	3,200,000
Total cases per year	1,600,000	800,000	800,000
Production, cases per hour	2,000	1,500	300
Production, cases per shift	15,000	11,250	2,250
Required shifts per year	107	71	356
Men per shift	18	18	9
Man-shifts required per year	1,926	1,278	3,204
Cost per man-shift, average	$11.68	$11.68	$13.58
Square feet board per case	4.52	7.04	7.95
Case cost per 1,000 cases	$64.55	$94.30	$105.50
Square feet kraft per bundle	—	—	3.26
Square feet kraft per case	—	—	13.04
50 basis cost of kraft per lb.	—	—	$0.0814
50 basis cost of kraft per sq. ft.	—	—	$0.000972
Kraft cost per 1,000 cases	—	—	$12.70
Label cost per bundle	—	—	$0.0084
Label cost per 1,000 cases	—	—	$33.60
Labor cost per year	$22,495.68	$14,927.04	$43,510.32
Case cost per year	$103,280.00	$75,440.00	$84,400.00
Kraft cost per year	—	—	$10,160.00
Label cost per year	—	—	$26,880.00
Annual equipment burden	—	—	$ 3,750.00
Casing cost per year, estimated	$216,142.72		$168,700.32
Estimated annual savings			$ 47,442.40
Estimated savings per dozen packages			$0.0148
Per cent return on investment			189.5

(The investment would be returned within six months.)

*Half of present annual production is in 1-dozen cases and half is in 2-dozen cases.

as premium pay for swing-shift work.

Sixth step is to determine the cost of packaging supplies for both the present and proposed operations, where such supplies will not be the same for both operations. Cost of the retail cartons would not be included, as the carton itself is not altered. However, the cost of cases, labels for bundles and wrapping paper for bundles must be included.

Seventh step is to make a tabular analysis of the six steps presented above, showing the estimated annual savings and estimated return on the investment. The decision as to further action on the project will be based on this tabulation.

Understatement

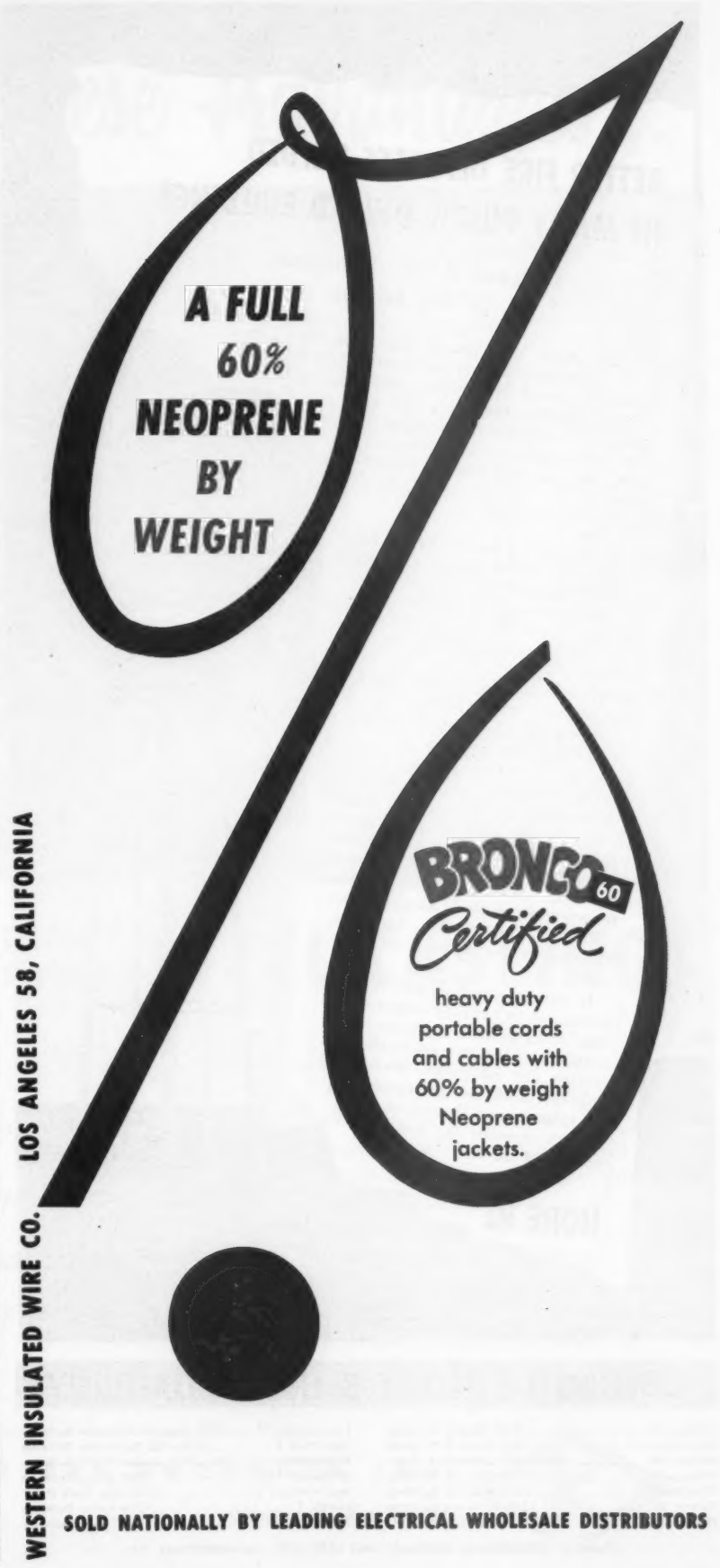
The accompanying calculations are on the conservative side. It will be noted that the same number of man-shifts per year are estimated to be required for the machine operation as are required for the present hand operation. More skilled labor will be required for the machine operation than for the hand operation. Therefore, the total cost of labor for the machine operation is estimated to be higher than for hand operation. This may be decreased in actual operation as fewer men may be found to be required.

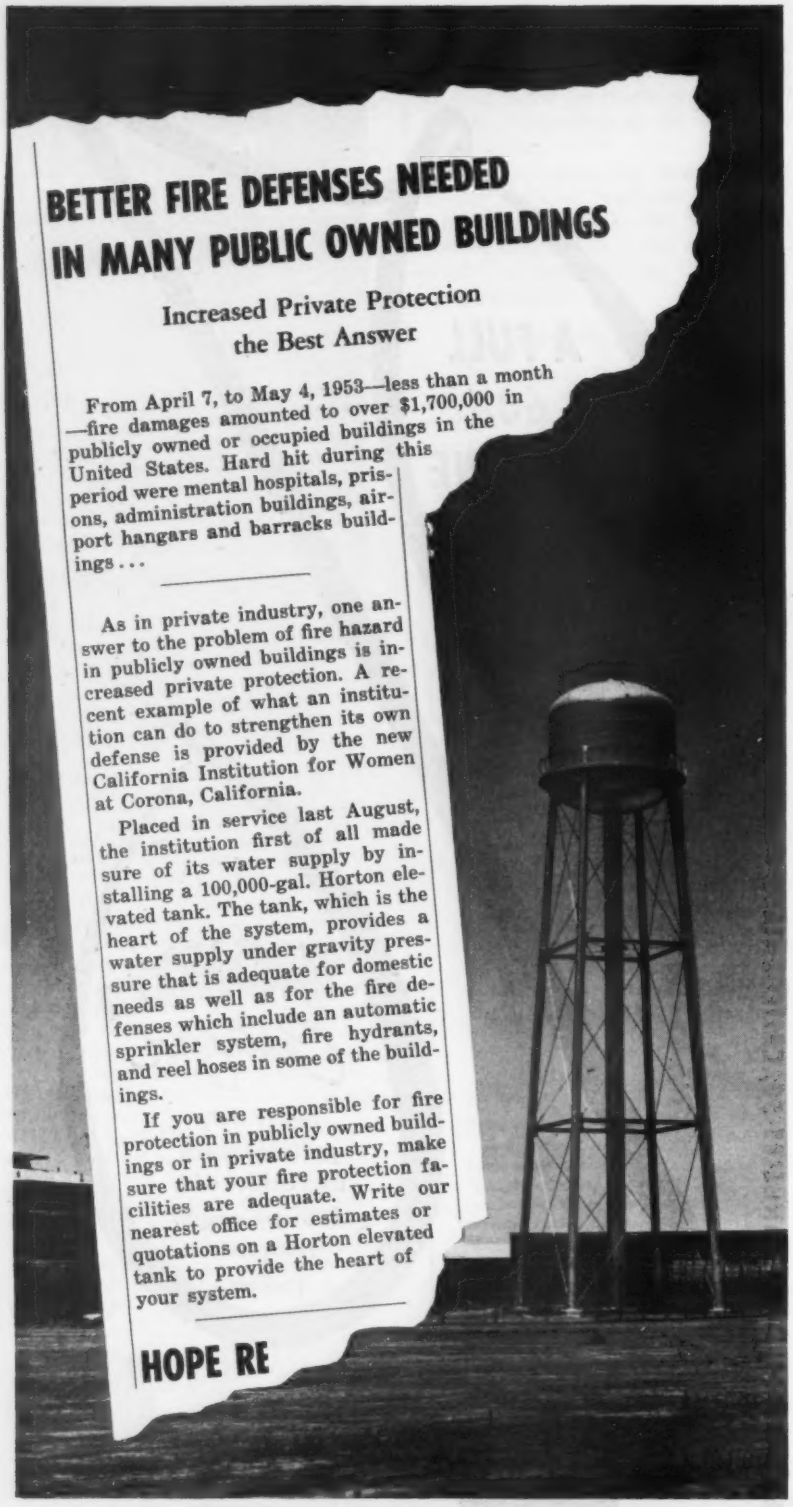
However, the use of machines permits the bundling of one-dozen packages and the casing of four bundles to each case, with a resulting high savings in case cost and over-all cost of casing supplies.

Additional savings

In addition to the savings in production costs made possible by the machine packing of four-dozen cases, there is a saving of the one cent per dozen which is charged on the one-dozen case at many cold storage warehouses and transportation terminals due to the one-dozen case being smaller than the allowable minimum. A secondary advantage is that the one-dozen bundles in the four-dozen case give the same flexibility for distribution as is obtained with the one-dozen case. Also, for distribution purposes, the four-dozen case may be reused by the distributor to deliver mixed bundles.

The resultant fast return of the investment within six months would be highly attractive to any company. It now becomes the responsibility of top management to satisfactorily solve sales problems in connection with the change of the shipping case and the use of bundles of one-dozen packages, and to make available the necessary funds required for the installation of the proposed equipment.




BETTER FIRE DEFENSES NEEDED
IN MANY PUBLIC OWNED BUILDINGS
Increased Private Protection
the Best Answer
From April 7, to May 4, 1953—less than a month —fire damages amounted to over $1,700,000 in publicly owned or occupied buildings in the United States. Hard hit during this period were mental hospitals, prisons, administration buildings, airport hangars and barracks buildings . . .
As in private industry, one answer to the problem of fire hazard in publicly owned buildings is increased private protection. A recent example of what an institution can do to strengthen its own defense is provided by the new California Institution for Women at Corona, California.
Placed in service last August, the institution first of all made sure of its water supply by installing a 100,000-gal. Horton elevated tank. The tank, which is the heart of the system, provides a water supply under gravity pressure that is adequate for domestic needs as well as for the fire defenses which include an automatic sprinkler system, fire hydrants, and reel hoses in some of the buildings.
If you are responsible for fire protection in publicly owned buildings or in private industry, make sure that your fire protection facilities are adequate. Write our nearest office for estimates or quotations on a Horton elevated tank to provide the heart of your system.
HOPE RE

CHICAGO BRIDGE & IRON COMPANY

Atlanta 3.....2144 Healey Building
Birmingham 1.....1563 North 50th Street
Boston 10.....1065—201 Devonshire Street
Chicago 4.....2132 McCormick Building
Cleveland 15.....2256 Midland Building
Detroit 26.....1567 Lafayette Building
Houston 2.....2164 C & I Life Building
Los Angeles 17.....1570 General Petroleum Building
New York 6.....3334—165 Broadway Building
Philadelphia 3.....1666—1700 Walnut Street Building
Pittsburgh 19.....3267 Alcoa Building
San Francisco 4.....1578—200 Bush Street
Seattle 1.....1369 Henry Building
Tulsa 3.....1667 Hunt Building

Plants in: BIRMINGHAM, CHICAGO, SALT LAKE CITY, and GREENVILLE, PA.

ROCKY MOUNTAIN industrial exposition

A SPECIAL innovation of the Rocky Mountain Industrial Exposition at Denver, Colo., will be a "by invitation only" showing between the hours of 2 and 6 p. m. on Thursday, September 10. The remainder of the show on September 10, 11 and 12 will be open to the public.

The Rocky Mountain Management Club, sponsor of the annual event, is a 10-year-old non-profit organization of 600 men in management positions. Their industrial exposition stems from individual company displays presented at regular monthly meetings since 1944. In 1947 the club originated an "annual industrial night," inviting other civic organizations as guests for the evening.

Due to rapid industrial expansion in the area and the ever-increasing attendance at the show, the club adopted their present pattern in 1950 and opened the gates to the public at a nominal charge.

Exhibitors as of July 22 are:

King & East Machinery Corp.; Overhead Door Co. of Colo.; Hamilton Management Corp.; Eaton Metal Products Co.; Armco Drainage & Metal Prod., Inc.; Hallack & Howard Lumber Co.; Landos, Zachary & Peterson; Inland Paper Box Co.; Public Service Co. of Colo.; Screw Machine Products Co.; Ace Sewing Machine Co.; DoAll Denver Co.; Denver Public Schools; U. S. Bureau of Mines; Sun Valley Electric Co.; Alta Engineering Co.; Industrial Nurses; Stearns-Roger Mfg. Co.; Arthur J. Hurt & Co.; Heckethorn Mfg. Co.; Electron Corp.; Bowman Biscuit Co.; Peterson Co.; Gardner-Denver Co.; Olson Bros., Inc.; Coors Co. of Golden; McCombs Supply Co.; Band-it Clamps; Gates Rubber Co.; C. A. Norgren Co.; Dixon & Co.; Krane Hat Co.; and Dow Chemical Co.

Inquiries should be directed to Harold S. Craig, Executive Secretary-Treasurer, Rocky Mountain Management Club, 1031 15th Street, Denver 2, Colo.

FORK LIFT TRUCKS for safer logging

THERE HAS been a vastly increased use of fork lift trucks at transfer landings for loading both trucks and rail cars with logs. Logging operators are encouraged by the jumbo capacity of these trucks which handle as many as 13 tons. Today's much improved trucks are finding increased use at mills and on log decks.

These improvements have created a need for revisions in California Safety Orders and a hearing has been scheduled to consider changes to make permissible greater use of fork lift trucks.

✓ Check these Advantages...

This trailer hitch demonstrates some of the advantages of the steel casting (above). Part at left is composed of six parts welded together.

...of K-B ELECTRIC FURNACE STEEL CASTINGS

- ✓ *Flexible in design*
- ✓ *Metal where required*
- ✓ *Lower cost in many cases*
- ✓ *More eye appeal*

More and more Western manufacturers are specifying K-B steel castings for parts previously produced by other methods.

Not only are savings usually effected in cost and weight, but in many cases appearance and performance are improved. The use of steel castings provides an economical way to meet required physical properties. In addition, replacement of a casting may be less difficult than replacements of built-up parts.

Have you considered the possibility of using steel castings in *your* product? Our engineers will be glad to consult with you without obligation. Just give us a call.

KAY-BRUNNER STEEL PRODUCTS, INC.

999 Meridian Avenue **Alhambra, California**

Maas SODIUM CARBONATE MONOHYDRATE
is a versatile chemical with many uses other than the photographic field. For example, it aids in brass purification.
Maas Sodium Carbonate Monohydrate gives better results in granulation of ores and oxides.
Maas Sodium Carbonate Monohydrate cuts costs in heat treating of titanium.
Maas Sodium Carbonate Monohydrate is used for steel carburizer energizer.
Maas Sodium Carbonate Monohydrate gives better results in impregnation of wood separators for storage batteries.
Maas
A. B. MAAS CHEMICAL CO.

ANOTHER TESTIMONIAL FOR GLUED UNIT LOADS

By WILLIAM EHLERS

Materials Handling Engineer
Bohemian Distributing Company
Los Angeles

WHETHER your business is the manufacture and distribution of an alcoholic beverage, or practically any other product, for that matter, your biggest single expense in running that business will be the handling of your materials.

In manufacturing this includes handling and storage of incoming raw materials; their movement through productive processes; and the handling, storage and eventual shipment of the finished product. In distribution it is the handling and storage of incoming materials, sorting to order, and the handling and eventual shipment of the completed order.

In this paper I shall limit my remarks to the handling, storage and eventual shipment of the finished product or the completed order.

Here it is 1952, the enlightened age of the fork truck and wooden pallet, and the edible product industry will pay out the staggering sum of $50,000,000 just to load their finished products and completed orders into box cars and highway trucks! Loading-out costs are now the highest in history. This, despite the near universal adoption of the fork truck and wooden pallet. Why?

The answer is quite simple.

Waste

The edible product manufacturer (again he is far from being alone) places a wooden pallet at the end of his production line and stacks the filled cartons, cases, etc., on it by hand. Once the pallet is loaded it is carried into the warehouse and stacked by fork truck. As orders come in, the fork truck then removes the pallet load from the stack and carries it to the shipping platform. Here it is placed either in a box car or truck. Now comes the greatest waste of money in industry today. After the pallet load is placed in the box car or truck it is hand stowed, a case at a time. Right here is where the fork truck and wooden pallet system falls on its face and costs go soaring. To get an idea of what the bill is for hand loading just box cars, all one has to do is multiply the number of cars loaded—750,000—by the average cost per car

Acme and Bohemian estimate big savings to follow from adopting this system . . .

—$20—and one arrives at the tidy sum of $15,000,000!*

Now what do you suppose happens when the car or truck reaches its destination? You're right—the whole load is put back on wooden pallets, a case at a time by hand. Since it costs as much to restack at destination as it originally cost to unstack, we'll have to add another $15,000,000 to find out what it is costing just for box car shipments. Now we are up to $30,000,000.

Since there are several times as many trucks loaded out as there are box cars, even though the cost is somewhat less due to their smaller capacity, it isn't hard to see how the total tops the $50,000,000 mark. And we haven't even mentioned the loss from damage, which reached the all-time high of $100,094,075 in 1951.

A better way

Surely there must be a better way. A way which will not only cut the exorbitant cost for loading and unloading but the frightful cost for damages as well. And there is—it is the glued unit load—a glued unit load on a sheet of paper instead of the loose load on a wooden pallet, and a fork truck equipped with a pul-pac device in place of the regular forks.

Let's go back to the manufacturer's plant and start at the beginning.

First, there is installed at the end of the present production line a simple, inexpensive glue applicator. This glue applicator is nothing more than a sprocket wheel mounted on a shaft in a pan of glue which is placed in the center of a short length of skate wheel conveyor. As each case crosses the applicator there is applied to its bottom a row of single glue dots. (A special glue with a high shear strength and a low tensile strength is recommended. This glue is readily available from any well-known adhesive manufacturer.)

A sheet of paper (specifications for this will vary—the average cost is 20 cents) is placed on the floor and the load is piled upon this sheet in exactly the same manner as it was formerly piled on the wooden pallet. Once the load has been completed, the fork lift truck, equipped with the special

*These figures cover the shipment of edible products for the year 1951.

How to make 150 containers disappear

Another example of packaging magic that couldn't be performed without Signode Steel Strapping!

The pallet load shown here contains 150 sub-assemblies, nested on returnable wooden trays, packaged for easy handling and shipping by strong bands of tensioned Signode Steel Strapping.

This method of packaging eliminated the use of 150 individual containers, and the materials needed to pack and seal them. Units were handled *once*—at the assembly line, where they were placed on the trays. Strapped to the pallet base, which also served as a tray, the trays became a single, pilfer-proof unit, easily handled by *one* man and a fork truck!

If you now ship by pallet or have products which can be shipped that way, and the economies apparent in this method of product packaging, handling and protection interest you, we will gladly supply detailed facts. Write Signode Steel Strapping Co., 458 Bryant Street, San Francisco, Calif. and 659 E. Gage Avenue, Los Angeles 1, Calif. Offices coast to coast. In Canada: Canadian Steel Strapping Co., Ltd. Foreign subsidiaries and distributors world-wide.

SIGNODE Steel Strapping Co.

SEND FOR FOLDER SHOWING 6 BASIC WAYS OF UNITIZING

pallet attachment, picks the load up and stacks it in the warehouse in precisely the same manner as was formerly done with the regular truck.

As orders come in this same pul-pac equipped truck removes the glued unit load from the stack and carries it to the shipping platform. From the shipping platform the load is carried into the box car or truck and is deposited in place as a unit, sheet of paper and all.

All hand labor in the box car or truck is completely eliminated. One man and pul-pac equipped truck perform the entire loading operation.

Now, what happens at destination? Again one man and pul-pac equipped truck perform the entire unloading operation, moving the unit loads directly from the car or truck and stacking them in the warehouse. All manual handling of individual cases or cartons is completely eliminated.

Carton separation

How are the cartons separated? Very simply, by lifting at one end. The secret is in the glue and the dotting. It is apparent that in lifting at one end a man is only required to break one dot at a time progressively until the entire carton is free. And what about damage in transit? All tests to date have amply demonstrated the fact that the glued unit load is the safest method there is for shipping any type of cartoned commodity.

Thus, the answer has been found to the high cost of loading and unloading. It is now up to industry to take advantage of it. The foregoing has dealt primarily with the shipment of material in one-way or expendable cartons or cases, by far the greatest proportion of the total tonnage moved

First beer shipment on corrugated sheets

Load: 800 cases of quarts in 16 separate units of 50 cases each, weight 36,000 lbs.

Unloading time: 30 minutes.

Loading empties time: 35 minutes.

These empties, in units of 50 cases each on corrugated shipping sheets, had been previously stacked two high on wooden pallets. In loading them out, the wide blade extension plates were inserted between the top of the wooden pallet and the underside of the corrugated shipping sheet. Thus, the entire unit load was lifted from the top of the pallet and carried into the truck.

Note: The loads were removed from the top pallet *without* lowering it to the floor.

Unloading empties: 24 minutes.

Distilleries are enthusiastic

A. D. FERRARI, general superintendent, Bohemian Distributing Company, Los Angeles, recently made a trip east with the prime purpose of initiating shipments, by rail, truck and ship, from the major distilleries to Bohemian in the form of glued unit loads.

He reports that the majority of the distilleries contacted were enthusiastic over the Bohemian program, and all could see the possibilities for a considerable reduction in handling costs. Bohemian expects to put the program in effect this summer.

PONY EXPRESS

MODEL B

2000 LB. CAPACITY

A lightweight, inexpensive, electric platform truck combining extreme maneuverability and rugged performance with low operating and maintenance cost.

Our sales policy has been to supply the best possible products at the lowest possible cost, with engineering emphasis on the elimination of maintenance which often amounts to twice the original investment.

In this policy we feel that we have been eminently successful. Our Engineering Department will continue to develop these two important principles of truck construction to better serve American industry.

Write today for specifications and information

ROCKY MOUNTAIN STEEL PRODUCTS, INC.

1361 Wall Street **Los Angeles 15, Calif.**

today. However, since the movement of glued unit loads has proved so eminently successful, some firms whose movements are of a local short haul nature have wondered if a unit load system without gluing might be practicable for the two-way movements of returnable containers.

Tests conducted by Acme Brewing Company and the Bohemian Distributing Company, both of Los Angeles, have now proved beyond a shadow of a doubt that such is true.

In these tests full cases of bottled beer were placed on sheets of paper, loaded in trucks, and transported to local distributing branches. These hauls involved distances up to 120 miles. Not only did the loads ride perfectly going out, but the same cartons filled with empty bottles rode just as well coming back.*

Savings

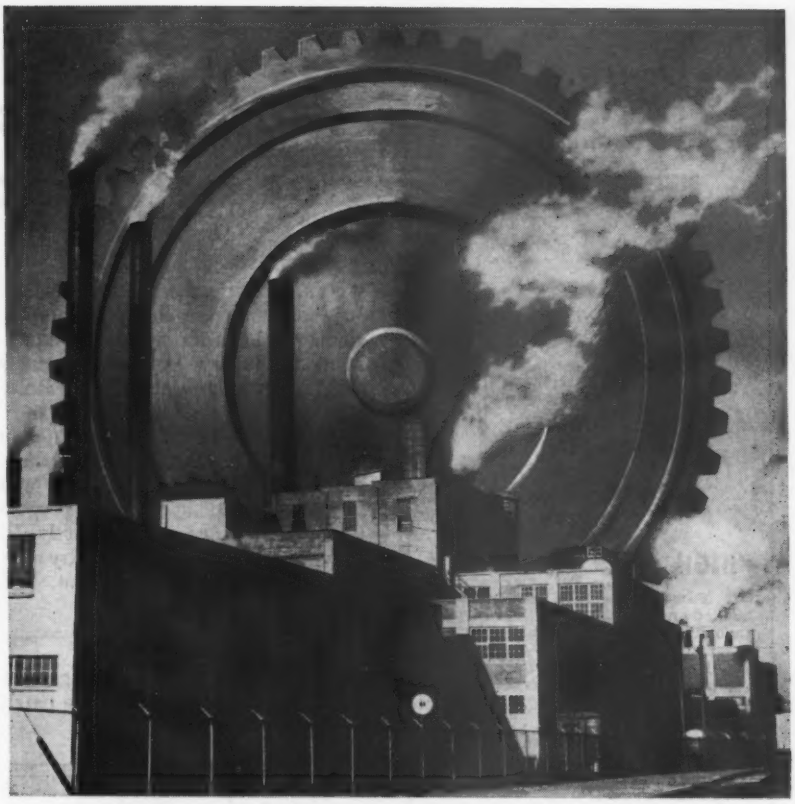
The potential savings to Acme and Bohemian are considerable:

1. Elimination of wooden pallet investment of approximately $50,000.
2. Elimination of repair and replacement of wooden pallets.
3. A large yearly saving in trucking costs by eliminating dead weight of wooden pallets. (Formerly each truckload, both going and coming, contained approximately 1,800 pounds of wooden pallets on which the beer rate was charged.)
4. An increase in pay load for the trucking company.
5. Elimination of the large investment in wooden pallets tied up in the dead storage of bottles during the winter months.
6. Elimination of lost space required by stacks of empty wooden pallets.
7. Better utilization of warehouse storage space by eliminating 5-in. thickness of wooden pallets. (They can now stack three high in warehouse with loads six layers deep in place of three high and five layers deep, or 30 more cases per stack.)
8. Better employee morale. Employees would much rather place a 2-lb. sheet of paper in position than a 70-lb. wooden pallet.

Inasmuch as both Acme and Bohemian were primarily interested in a maximum number of round trips per sheet, a different type of paper was developed in place of the low-cost one-

Continued on page 93

*It is obvious that the same results would be obtained in the movement of all other alcoholic beverages.



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RICHFIELD PRODUCTS

EAGLE OIL R&O

The Lufkin Line

By Al McConville

Al McConville

"HIGH GEAR VACATION"

Vic Fawcett grabbed his hat and headed on a dead run for the doorway throwing casually over his shoulder the following remark: "Al, I guess you'll have to write the Lufkin Line column. I'm going on a vacation."

So you see, it can happen and here I am with a choice of any combination of the 26 letters in the alphabet and the responsibility of bringing you up-to-date on the activities of the Lufkin organization.

I can't think of a better way to get started on my new assignment than to mesh the gears . . . Lufkin gears, that is . . . and acquaint you with a well-known fact in the industrial world—Lufkin gear cases contain the finest precision cut gears in America today. And the recipe for this fine product is simply a combination of two things: the best raw material and the finest workmanship. You might say it's sort of like baking a cake . . . good ingredients plus competent cooking. Of course, we don't take a broom straw and jab it into the gear to see if it's done. We use scientific testing instruments to prove the quality and a rugged running test in the shop to prove the durability and performance. We top it with the most rigid final inspection to make sure there's no margin for error.

We are confident in the quality of our product and we have gained the confidence of our customers because they know the quality of the service after the sale that has become a Lufkin tradition. Yes, service with Lufkin is just another reason why industry all over the world has learned to rely on Lufkin Gear Units as the world's best buy.

Now, I can only hope that Vic reads this and sends in an order for a speed Increaser or Reducer. That would certainly prove I am a successful substitute columnist. If he doesn't, I'll just take a vacation myself when he gets back.

Al. McConville

Lufkin Foundry & Machine Co.

PACIFIC COAST DIVISION
5959 S. Alameda St., Los Angeles 1, Calif.
Dallas Lufkin, Texas New York

AUTOMATIC PROPORTIONING OF DRY CONCRETE MIXTURES

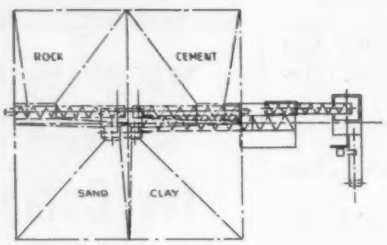
ONE OF the most recent developments in the automatic proportioning field is the system of equipment at the new Dry Mix Products plant now under construction at Roseville, California.

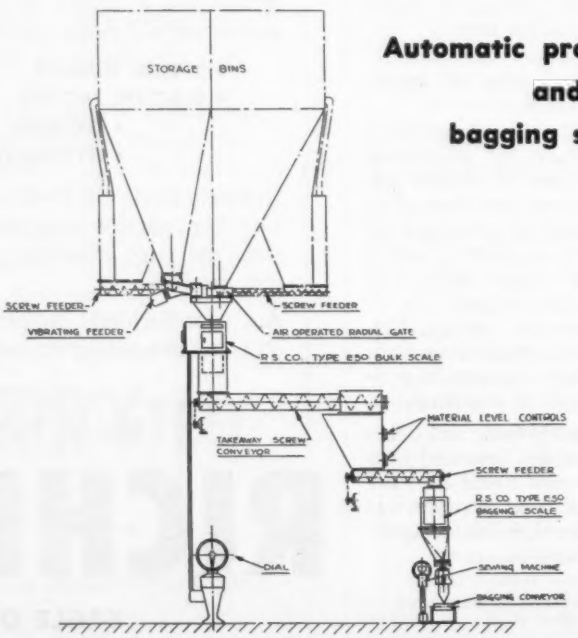
This arrangement incorporates a compact electronically controlled dust-tight automatic weighing unit and high-speed bagging scale to proportion and package approximately 15 tons per hour of the following dry mixtures: concrete, mortar, grout, and sand-clay mixes.

Semi-continuous process

The Dry Mix Products arrangement cannot be classified as either a batch or continuous system. Its manufacturers have termed it a semi-continuous process, since it incorporates many features and advantages of the aforementioned equipment. Proportioning is done in relatively small batches (200 pounds every 24 seconds) to eliminate the possibility of segregation and also allow for the use of a continuous mixing conveyor.

This method offers a continuous stream of accurately proportioned materials without losing the important advantages of batch weighing equipment. These are: first, ease of checking ingredient quantities; second, precise weighments; and last, over-all flexibility which in most cases amounts





Automatic proportioning and bagging system

Semi-continuous process provides product control with

- ***high output and***
- ***minimum manpower***

By
R. H. SCHONFISCH
West Coast Manager
Richardson Scale Company

to less time required for proportion changes.

Feeding equipment

As illustrated in the general arrangement drawing, this system employs several different types of feeding or control equipment to deliver basic materials to the proportioning unit. This is important, since it illustrates that the batching scale does not incorporate standard feeders, and therefore such machinery can be selected primarily on the basis of the materials to be handled. Actually this job utilizes a vibratory tray for hot crushed rock, air-operated gate on highly abrasive sand, and screw feeders for the flushy fine-ground cement and clay.

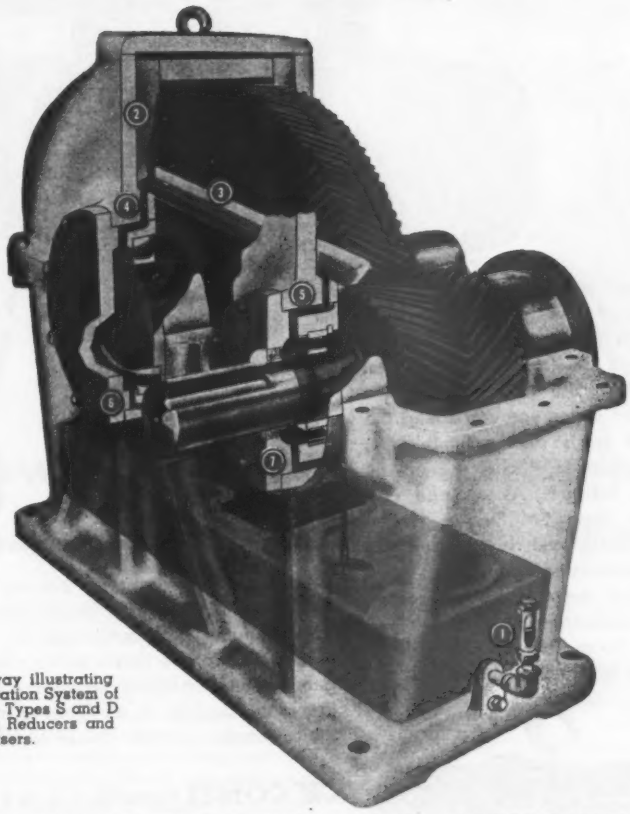
Basic proportioning unit

All of the aforementioned feeding devices terminate in a small inlet chute above the compact proportioning unit. This batching scale is enclosed in a dust-tight housing that does not require the usual canvas sleeves which tend to lessen beam sensitivity. A unique discharging device not requiring direct connection to the weigh hopper also insures accurate dial indication at all times. For convenience of operation, the scale's dial (0 to 250 lb. range) is located on the plant's main floor adjacent to the system's remote control panel.

Remote control panel

In view of the location of the proportioning unit, a dust-tight remote control panel is used to facilitate ground floor operation of the entire system. This panel is equipped with the following basic controls: four vernier weight selectors (5 to 200 lb. range) which are used to set the desired quantity for each batch ingredi-

gears with Guts



Cutaway illustrating Lubrication System of Lufkin Types S and D Speed Reducers and Increasers.

LUFKIN GEARS FOR INDUSTRY

You buy more than Gears when you order from Lufkin. Yes, Lufkin Gears are the product of an organization with a reputation for quality equipment since 1900. Lufkin Gear assemblies are serving all types of industry from Paper Mills to Pipe Lines, and Lufkin Gears are a part of every one of the famous Lufkin Pumping Units . . . Pumping Units that have won the respect and confidence of oil Producers the world over . . . A quarter of a century of performance under rugged conditions qualifies Lufkin as producers of Gears With Guts.

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Gear Assemblies for SPEED REDUCING and SPEED INCREASING SERVICE

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LUFKIN, TEXAS
Pacific Coast Div., 5959 S. Alameda St., Los Angeles 1, Calif.
OFFICES IN DALLAS • HOUSTON • NEW YORK

MORE PRODUCTION from each PRODUCTION DOLLAR

An immediate way to realize more production per manhour—and at minimum investment—is by the installation of CM Electric Hoists. By making use of non-productive overhead space you can speed the flow of parts and assemblies... raise employee efficiency levels... reduce fatigue. As anyone can operate these CM Electric Hoists, skilled manpower is released for other production operations. Valuable floor space is made free for added production. Here are two CM electric hoists favored particularly by plant production executives.

CM METEOR Capacities: ½ to 5 tons

Low headroom wire rope electric hoist for heavy duty service. Single and two speed models. Push button control. High efficiency airplane type cooling. Helical gears. Fully enclosed operating parts. Precision bearings at all rotating points. Plain, geared or motor driven trolleys.

CM COMET Capacities: ⅛ to 2 tons

Portable, compact and rugged electric chain hoist. Available in push button and pendant rope control models. Equipped with flexible HERC-ALLOY load chain. Fully enclosed working parts. Upper and lower safety limits. Permanently lubricated. Plug in on 110, 220 or 440 volt power line. Used extensively in production operations.

● **CM Electric Hoist Catalog** sent on request with prices and name of your local CM distributor. Production executives find our catalog a good source of hoist information.

CM HOISTS AND CHAIN

CHISHOLM-MOORE HOIST DIVISION

COLUMBUS McKINNON CHAIN CORPORATION

TONAWANDA, NEW YORK

DISTRICT OFFICES: NEW YORK, CHICAGO, CLEVELAND

Western Factory Representative—T. F. Wallace

Los Angeles: 816 West Fifth St. San Francisco: 320 Tenth St.

ent, material selection switches, test run control for interrupting the proportioning cycle to allow for ready checking of various ingredient weighments, and in addition to the usual run of conventional controls a complete set of pilot lights for indicating cycle progress for full remote orientation.

General operation

The operation of this system can best be followed by referring to the included general outline drawing. Basically, the proportioning equipment is capable of drawing from four 30-ton overhead bins. For simplicity's sake, let us say that each bin has been predesignated to hold a certain material. Therefore, vernier weight controls and feeders 1 through 4, as numbered on the operating panel, can be assumed to be sand, rock, cement, and clay respectively.

With the desired material quantities set on the remote panel, the system is then placed in operation. Control No. 1, if selected, will deliver a stream of sand to the scale's weigh hopper and automatically cut off when the proper quantity has been reached. Number 2 control then takes over and delivers its predesignated number of pounds, and so on until all required quantities of materials have been weighed in and the batch is completed.

A typical batch for this installation is the "concrete mix" consisting of 93 lb. sand, 67 lb. rock, and 40 lb. cement. However, this is of minor consequence since any quantity from 5 lb. to the maximum scale's capacity (200 lb.) can be accomplished, the number of ingredients being limited only by the number of weight controls and storage bins. Upon the completion of all ingredient weighments, the scale discharges, and after automatically checking empty tare balance, repeats the aforementioned cycle.

Goes to surge bin

The batched material is dumped to a continuous mixing conveyor of ribbon design, which delivers it to a small surge bin located above the bagging unit. This bin has two material level controls, the lower locking the bagging scale unless sufficient material is present for an accurate weighing, while the upper control interrupts the batching unit if the bagging operation is lagging behind the overall production rate. With these controls, production is governed entirely by the bagging installation, an important factor if one-man operation is to be accomplished.

The Dry Mix Products batching operation to which this article is devoted is but one application of equipment which has unlimited possibilities.

Similar systems have been used to proportion up to 14 ingredients with batch sizes ranging in thousands of pounds. Variations which incorporate card or record control and numerous devices to integrate operation to a particular process all add to greater flexibility and increase the field of application.

GLUED UNIT LOADS

. . . continued from page 89

trip expendable sheet normally used. Their sheet of paper is normally good for ten round trips, and costs approximately 55 cents each, compared with the one-trip sheet ordinarily used in the shipment of glued unit loads.

As those who follow the developments in materials handling equipment know, there are now on the market several automatic palletizing machines. These machines automatically pile the load in desired patterns on a wooden pallet.

It will be of interest to know that a new machine, developed by Unit Loader, Inc., of Los Angeles, will soon be on the market which will automatically form either glued or unglued unit loads on a sheet of paper. From all indications this machine will be considerably simpler in design than existing palletizing machines and should, therefore, be considerably less expensive.

VERSATILE LOADER cheapens truck loading

BUILDERS Supply Corp., Phoenix, Arizona, has developed a new Superlite unloader to handle the need for a better, more efficient and cheaper means of unloading concrete blocks.

Block handling in the yard in loading onto trucks has been improved a great deal through the years with no corresponding improvement in block unloading from truck to job. The new unloader, however, reduces unloading time to a matter of minutes rather than hours. Delivery costs are cut 50% on normal hauls. A greater return on truck investment and a greater output from the driver have also been provided.

The loader, which also handles clay tile, sack cement, barrels or drums, crates, boxes and machinery, can be mounted on any standard truck or trailer. The carriage is easily installed, removed in a matter of minutes, so the truck or trailer can be used for other purposes if desired. Hydraulically operated, controls may be operated from either side and are within easy reach of the operator.

How Wyandotte Chemicals Saved 35% in Storage Space

By building its materials handling system around Lewis-Shepard SpaceMaster Electric Fork Trucks, Wyandotte Chemicals Company, Wyandotte, Mich., got more efficient storage for over 250 different items . . . in 35% *less floor space.* And many of Wyandotte's dependable L-S SpaceMasters work 16 hours a day with a minimum of costly maintenance attention.

WHY WYANDOTTE PICKED SPACEMASTERS

Here are some of the reasons Wyandotte supervisors selected SpaceMaster battery powered trucks: compactness; high capacity-to-weight ratio; full free lift; dependable performance; minimum maintenance.

SPACEMASTERS CAN SAVE YOU MONEY

Want proof? . . . Then, write for "Proof Folders" that show how companies in many industries are saving with Lewis-Shepard Electric Trucks. You're invited to inspect this proof . . . draw your own conclusions.

"Proof Folders" include facts, figures, and familiar company names. Every word is a direct quotation or approved by the company concerned. They are the true materials handling experiences of both large and small users in many industries, told in a way that's interesting and informative.

Send for "Proof Folders" and Comparison Charts today! If you prefer, call our local representative listed under "Trucks, Industrial", in the Yellow Pages of your telephone book.

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PORTABLE vulcanizers are often part of a belting maintenance shop in larger firms.

RUBBER CONVEYOR BELTING
how to choose and maintain it

By
WILLIAM G. PETERSON
Vice President and General Manager
Thermoid Western Company
Nephi, Utah

THERE ARE MANY different types of conveyor belts available today for a wide variety of both standard and special service, but all belts have a similar construction consisting essentially of carcass and cover.

The belt carcass is made up of one or more plies of cotton fabric duck in which the lengthwise (warp) threads are woven over and under the cross (filler) threads, thus giving a distinctive elastic quality in the direction of travel. The warp threads provide the primary strength of the belt.

Duck is specified by the weight per linear yard (42-in. width) such as 28 oz., 32 oz., 35 oz., and 45 oz. When belting is subjected to severe flexing conditions, a thin sheet of rubber between the plies, known as a "skim," is advantageous.

Covers for conveyor belt are compounded of natural and synthetic rubber stocks, together with other ingredients which vary according to the service for which the belt is intended. A smooth rubber surface is normally used and is furnished in various thicknesses to resist abrasion, heat, cutting and gouging. For severe service, a breaker strip is inserted under the cover. This is a ply of open mesh fabric, which increases cover adhesion for maximum resistance to cover separation.

A special construction

Although each ply of the belt carcass usually extends completely across the width of the belt, a special type is available which is known as step-ply construction. The belt thickness is uniform, but a thicker layer of rubber is provided in the center and additional duck plies at the sides. This construction is to be considered when there is extreme wear in the middle of the belt, as is found in handling abrasive materials.

In industrial plants usually the top cover is thicker than the bottom cover because the top cover sustains the most wear, but there is a trend today toward use of thicker covers on the bottom in severe, abrasive service to cope with bottom cover wear.

Although a smooth surface belt is accepted as standard in most industries it may be of interest to know about some of the special belts that are available. The jobs done by standard and special belts in all types of industry are amazing and new belts are constantly being designed to handle new tasks. The canning industry uses a belt with a special white, acid-resistant cover which does not impart odor or taste to food in canning factories. This belt can easily be cleaned to prevent

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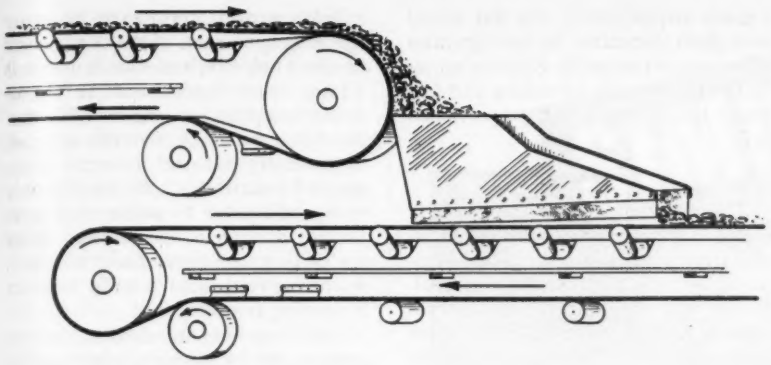
FREE CONSULTING SERVICE AND METALLURGICAL LABORATORY
to study, test and make sure you get the right type of forging, steel and grain structure for your job.



ILLUSTRATED correct loading procedure has drop from belt to belt at a minimum. An adequate number of idlers around the chute prevent "spanking" or "chattering."

accumulation of food in the pores of the belt.

Another belt is made for operating in temperatures from 270 to 350 deg. F. The carcass is composed of specially-treated glass fabric and the carcass is encased in a special heat-resistant fabric envelope. A ply of asbestos is added under the cover for additional insulating properties.

In cases where long belts are required by special conditions, rayon duck or rayon cord can be used in the carcass for extra tensile strength instead of cotton. In rare instances steel wire or cable is used for extra strength, where the center to center distance of pulleys measures thousands of feet but steel-cable belts are almost prohibitively expensive.

Belt selection

To choose the correct *type* of belt from the many constructions available, consider first the size, density and sharpness of the pieces of material. Large pieces of heavy rock in sharp fragments will require a belt with a thick cover, breaker strip and several plies with skims. Light, fine material can be moved on a less rugged belt.

Allow for extremes of temperature of both material and working environment. Belts for both hot and cold materials and climates can be produced.

Moisture content of the material is important. Wet mixtures take a different belt than dry ones.

Material in fine sizes, if abrasive, may require a heavy cover in spite of the small particles. Belt color is important in some industries. Consider specifying special molded covers for handling standard parts in manufacturing plants.

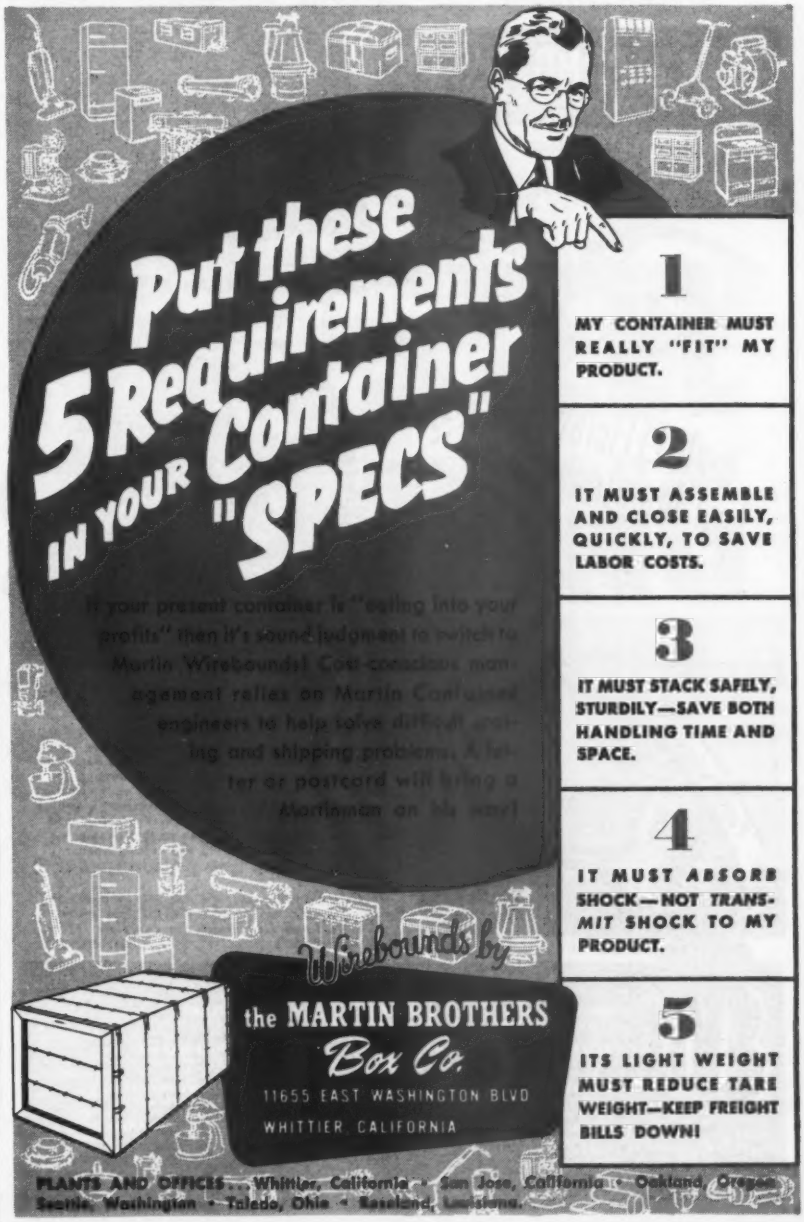
Width and number of plies

The size of the belt is dependent upon the rate at which the material is to be moved, the distance and horsepower required to move the loaded belt.

In general, the wider the belt, the greater the cost. It is axiomatic that for a given tonnage per hour, the faster the belt travels, the narrower the belt required. However, the faster the belt runs, the more often it will pass the loading point and the greater will be the wear and maintenance.

So it does not pay, in the long run, to save on the first cost of conveyor belting by running a narrow belt at high speed. And, conversely, the capital cost of belting will be excessively high if a very wide belt is run at relatively slow speeds.

A break-even point should be calculated, in which a great many factors must be accounted for. For example, a high-speed belt requires more expen-


Put these
5 Requirements
IN YOUR Container
"SPECS"
1
MY CONTAINER MUST REALLY "FIT" MY PRODUCT.
2
IT MUST ASSEMBLE AND CLOSE EASILY, QUICKLY, TO SAVE LABOR COSTS.
3
IT MUST STACK SAFELY, STURDILY—SAVE BOTH HANDLING TIME AND SPACE.
4
IT MUST ABSORB SHOCK—NOT TRANSMIT SHOCK TO MY PRODUCT.
5
ITS LIGHT WEIGHT MUST REDUCE TARE WEIGHT—KEEP FREIGHT BILLS DOWN!
Wirebounds by
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sive rollers. On the other hand, a wide, slow-speed, belt will take longer rollers which may be just as expensive. The high-speed rollers will require more attention after installation. Fortunately, there are many tables, formulae and standard practice guides to assist the design engineer in making his choice.

A well-proportioned belt has enough plies to support the load and withstand tension. It must be flexible enough to trough and bend over pulleys without excessively stressing the belt. In general, the minimum ply belt to support the live load also satisfies tension requirements. On flat travel over short distances, the belt operates below tension capacity. Refer to manufacturers' manuals for tables and formulae in choosing a well-proportioned belt.

Edge wear

The edges of a belt are carefully sealed in manufacture to prevent moisture from getting into the belt. Excessive edge wear destroys the edge seal. Water will then attack the carcass causing mildew and rot. If the water freezes, the ice particles will rapidly destroy the belt.

Edge wear is considered by many specialists to be one of the chief causes of short belt life, and misalignment is a large factor in edge wear. It is absolutely essential for long belt life that the belt carriers be correctly aligned. It generally pays off in terms of increased belt life to take considerable time and trouble to secure as close to perfect alignment as possible. Many installations are aligned with a transit. Reducing edge wear usually means a reduction in power.

It is becoming standard practice to compensate for excessive edge wear by cutting off the worn edges before the belt has completely disintegrated and using the reclaimed, narrower belt in less severe service. New liquid neoprene compounds are available for sealing the newly formed edges against moisture. Liquid neoprene is also useful in building up worn spots in the cover to prevent more extensive repairs later.

Skirt boards are another primary source of edge-wear. Construction and placement must be carefully engineered by qualified personnel. The use of jerry-built, "baling wire" contrivances should be avoided. Fasten skirtboards firmly so that they will not eventually loosen and drag on the belt.

Loading impact

Loading conditions are a prime factor in belting deterioration. The loading point is a danger zone. Both existing and proposed installations should be regarded with the intention of creating "ideal" loading conditions.

One of the basic requirements for long belt life is that the material fall on the belt while moving in the same direction and at the same speed as the belt.

The material should be directed on the center of the belt, not toward one side. Material falling on the left side will make the belt ride out toward the right, and vice versa. As a result, the belt will not train properly and will rub against guard boards and training idlers, if used, increasing edge wear.

When lumpy material is being carried, an attempt should be made to have such material cushioned by a prelaid layer of fine material. A screen or "grizzly" at the bottom of the loading chute will satisfactorily deposit a layer of fines over the belting, thus providing protection against bruising. In some instances an oval or "fish tail" notch cut in the lip of the chute will aid in prelaying the fines.

At the same time, the velocity of loading-material flow should be controlled by pitching the loading chute properly. If this is not feasible, a baffle of iron or wooden bars should be

. . . at long last!!

CLEAN CONDENSERS

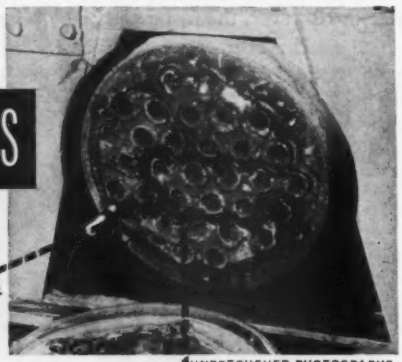
Without { ACIDIZING OR RODDING!

AUGUST 5, 1952

MARCH 20, 1953

High Efficiency Low Maintenance

Buchanan Refrigeration Service (of Redwood City) made the Broadway Market installation. Foreman's (of Belmont, Calif.) made the photographs.



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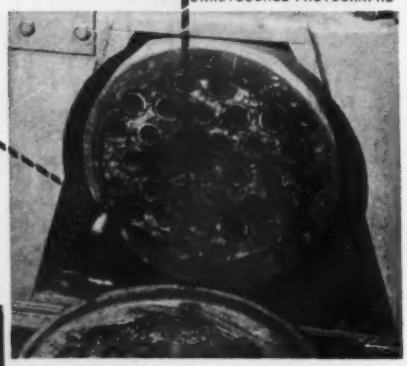

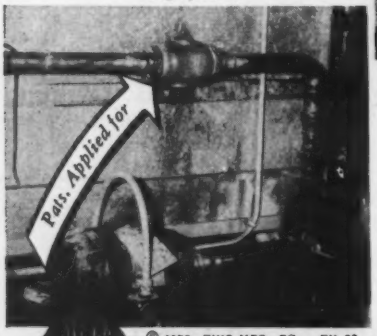

The Broadway Market, in Redwood City (Calif.), is but one of many hundreds of amazing EVIS installations. All over the United States EVIS Water Conditioners are conquering scale in practically all types of refrigeration equipment. The top photograph was made at the time the Evis was installed . . . a quarter-inch rod was driven through the tubes . . . two weeks later much of the scale was sufficiently soft to be prodded out with a small diameter tube . . . the condenser was not opened again for six months . . . the bottom photograph clearly shows what the EVIS had accomplished.

• • •

If Evis Conditioners are not yet available in your locality . . . phone or write your nearest Evis Regional Distributor for complete information.

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constructed in the chute, suspended from the top and free-swinging at the bottom, to reduce the velocity of material flow onto the belt.

In like manner, the vertical distance between chute and belting should be small to prevent excessive velocity of material which, in the case of lumpy material, might be great enough to cause belt damage.

Material should not strike the belt directly above a solid pulley because the resulting hammer-anvil action will quickly render the belting unusable. The chute should be located so that material will strike the belt between idlers. However, in cases where heavy material is being loaded, it may be necessary to load directly over rubber covered or pneumatic idlers.

In some cases, impact load between idlers will set up belt vibration. Resultant chattering may depress the belt sufficiently to allow material to escape under the skirt-boards. This may be prevented by locating the chute so that loading material will strike the belt far enough ahead of the tail pulley to allow insertion of at least one belt-steadying carrier pulley. Also, carrier pulleys should be more closely spaced around the loading zone because of the impact loading of belt at that point.

Design loading chutes properly

Construction of loading chute skirt-boards and flexible skirts should be carefully considered. Skirt-boards should not touch the belt but should be positioned slightly above the belt. They should be long enough to settle the material before it leaves the loading area. Flexible skirts are preferably improvised from rubber-covered edges of belting remnant. These remnants should be placed so that the rubber-covered edge is next to but not touching the belting. Should this be reversed, and the exposed-fabric edge of remnant placed against the moving belt, grit will collect in the fabric. Resultant abrasive action will, in time, wear a track through the belt cover.

Vertical spacing between chute skirt-boards and belt should increase toward the open end of the chute. Thus the width of flexible skirts, as cut from a belt remnant, should decrease in the direction of belt travel. This construction minimizes spillage around the loading point. At the same time, wedged-in lumps of material will work themselves free by the forward motion of belting.

Pre-installation

Belt maintenance begins even before the belt is installed. When received by truck or railroad from the manufacturer, it should never be dropped off

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but should be skidded, rolled or lifted. A large roll of belt will weigh several tons.

A short computation will prove that several tons falling from a freight car will develop a surprising impact over the area of contact, enough to weaken the belt. If the belt roll falls on a stone, tool or track, a cut or puncture may result. If the belt is not installed at once, it should be stored, protected from sunlight, where it is not likely to be damaged accidentally.

Installation threading of the belt over the idlers and pulleys is critical and much belt damage may occur during installation. More than ordinary care and planning are needed. Avoid sharp bends. Minimize dragging over sharp rough surfaces. Don't twist sharply. Before belt is run, check for tools left accidentally on the return side. Don't use excessive tension in pulling the belt over the idlers and pulleys.

Maintenance organization

Authority and responsibility for belt maintenance should be delegated to one man who, with his assistants, checks lubrication, condition of idlers and pulleys, examines the belt for excessive wear, inspects splices at frequent intervals, repairs cuts and tears as soon as discovered, maintains a kit of belt repair tools.

The belt maintenance boss should also check the belt for oil and grease which should be removed. Avoid overlubrication of pulleys and idlers. In large companies using many thousands of feet of belting, a rather elaborate organization may be justified, including a belt repair shop with both portable and permanent vulcanizing equipment, belt tables, drying racks.

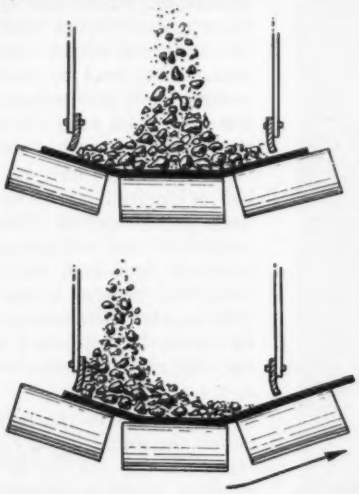
Even in the best regulated plants, some material falls off the carrying surface of the belt onto the bottom cover or return side of the belt. If not removed, severe damage to the belt will occur when the belt travels around the pulley and the misplaced pieces are squeezed between belt and pulley. Brushes and scrapers are often used, but the best solution to the problem is to completely cover the return side of the belt with a wooden or metal deck.

When a permanent installation is made out-of-doors, it will probably pay to cover the belt with a wooden or steel structure. This will keep off direct sunlight which speeds up oxidation, another enemy of rubber belt. One company has covered a wide belt with a long, continuous Quonset hut which is heated in winter.

Belt repairs

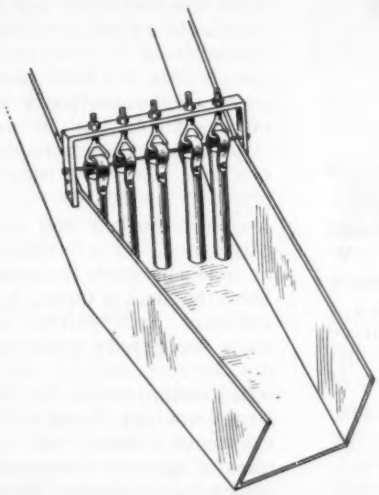
In order to get the maximum service

life out of conveyor belting, users should take particular care to repair all belt damage as soon as it is discovered.



TOP ILLUSTRATION shows correct loading on the center of the belt. Bottom shows what happens when loading is off-side. Belt rides in opposite direction causing poor train and wear.

Belt fabric exposed to weather will absorb moisture if the protective cover becomes damaged, and may even become soaked. In warm weather, this condition leads to mildew and rot; in winter, ice crystals may gnaw at the fabric from within as the belt flexes. Thus, immediate repairs not only prevent the spread of damage, with its threat of premature failure, but also keep out the water which is the natural enemy of the conveyor belt carcass.



HEAVY METAL or wood bars, suspended from the top of the chute and free to move at the bottom, prevent excessive velocity of material when conditions prevent gradual slopes.

Simple tools and procedures will help the maintenance man to give belting proper attention. An adequate repair kit includes sharp cobbler's knives and a stone to keep them sharp; a supply of emery cloth, rubber cement, inner tube patching rubber, rip plates and standard belt fasteners and accessories, together with rags and gasoline for cleaning. As each belt is installed, remnants should be saved, because they will prove useful in subsequent repairs.

To mend long and deep cuts which go through to the fabric, open the cut, clean out all dirt, and cement the cut

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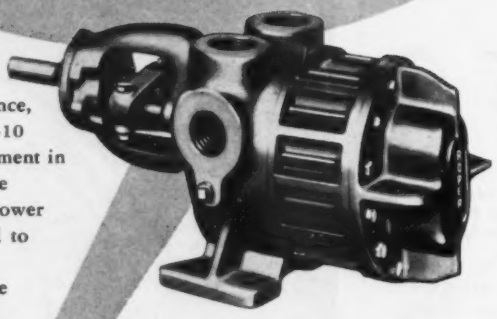
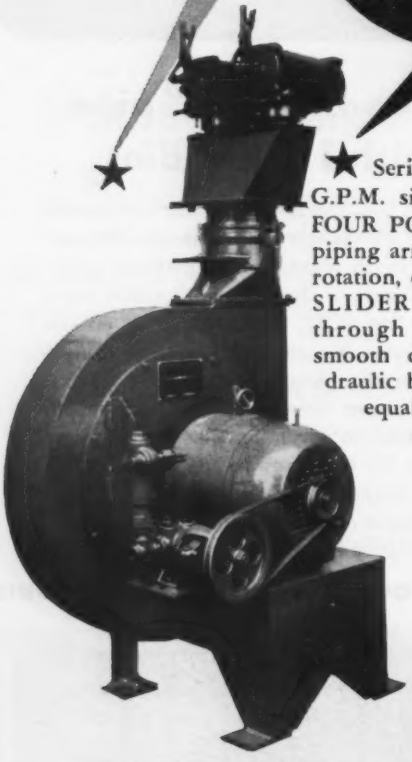


Hopkins Volcanic Specialties, Inc., of Alliance, Ohio, uses the Roper F-10 Pump as original equipment in their burner system. The pump, driven off the blower motor, supplies fuel oil to the unit. Hopkins Volcanic Burners, adaptable to any size and design of dryer, are the result of 30 years experience in the combustion engineering field.

FACTS YOU WANT TO KNOW *About the Series F Pump*



★ Series F Pumps available in 1-300 G.P.M. sizes — pressures to 300 P.S.I. FOUR PORT DESIGN — eight optional piping arrangements, 4 CW and 4 CCW rotation, cuts installation time and costs. SLIDER COUPLING — on sizes 1 through 20 G.P.M. permits positive smooth drive and maintains axial hydraulic balance. HELICAL GEARS — of equal size, are heat treated and precision ground. Flange type bronze bearings give ample support to pumping elements. MODEL shown has Packed Box; also made with Mechanical Seal. Relief valve models available.

Send for Catalog 953

GEO. D. ROPER CORPORATION
Pacific Coast Office, Pump Division, 2011 S. Santa Fe Ave., Los Angeles 21, California

ROPER *Rotary Pumps*

closed, allowing the cement to dry thoroughly before the belt is restored to service. Where bits of torn cover leave exposed spots with only slight damage to the fabric, remove the loose ears of cover stock by carefully cutting a curved and bevel-edged area around the spot; then sand the edges, apply the patch flush with the belt cover.

Where gouges have penetrated the belt, or longitudinal rips have occurred, these points must be cleaned, sanded, cemented and reinforced with rip plates at three-inch intervals. Transverse rips require similar treatment with standard belt fasteners instead of rip plates. Use rip plates on longitudinal rips only, and standard fasteners on transverse rips only.

When holes in the belting do not permit the simple use of rip plates and fasteners, cut out the hole into the smallest possible rectangle with its sides parallel to and at right angles to the belt edges. Then, from belting remnants, cut an exact fit for the hole and insert the piece, fastening it with belt fasteners all around the patch. Cement all edges thoroughly. Where it is necessary to prevent seepage of fines through belt repairs, remove one ply of fabric from a belt remnant and place it under the fasteners and rip plates.

Vulcanized patches are superior to those described above, but require the addition of a portable vulcanizer, rubberized fabric, tie gum, cover stock, a one-ply knife and fabric pliers. In preparing a vulcanized patch, work down into the damaged belt as far as necessary by removing progressively smaller blocks of fabric with each successive ply.

Clean, roughen and cement the cavity, neatly fit in blocks of new fabric and finally apply the uncured cover. Skive the edges of the patch flush, and vulcanize. Such patches cannot be made successfully unless the belt is dry, because moisture will form internal steam blisters. For this reason, large users have drying racks in their maintenance shops. Only very large users of conveyor belting will find it economical to vulcanize their own belt patches and splices. Small users may call on the manufacturer or his distributor for splicing and repairs.

HEAT-TREAT PROCESSES and gas-tight muffles

IN THE MANUFACTURE of metal products such as machine parts, tools, etc., some form of heat treatment is generally conducted at some stage in the process.

Conveyor mechanisms of a great

variety of designs are used to carry the metals being heat-treated into and through the heating chamber in the continuous heat treating furnaces.

A variety of cast parts and accessories are used in the various type conveyors. Among these parts are: walking beam rails, roller rails, rotating shafts, side rails, link conveyors, mesh belts, chain and sprockets, and shaker hearths.

Cast gas-tight muffles are required when special chemically reactive atmospheres are to be employed in contact with the metal being heat-treated. This includes: gas carburizing, nitriding, clean and bright hardening and annealing steel, brazing and sintering of powder metallurgy products.

INSTRUMENTS take to the farm

WHEN INSTRUMENT manufacturing develops in a strictly farming area, instead of in the heart of Aircraftdom or Electronicsville, it should be considered news. So a *Western Industry* editor on a field trip reports the following from Idaho Falls, Idaho:

A level that farmers can use without getting their minds, fingers and tempers all tied up in knots in the process of adjusting it for use, has been developed by D. H. Loosli of that city. All troublesome adjustments have been left off, leaving only the elevation screw to bother with. Instead of trying to match up with a graduating dial to get the right position, the level merely needs to be rotated to one of four pegs on the base disk.

For farm use and other simple applications, it is reported to be filling the bill beautifully.

LOCKED LOADS cut shipping costs

THE APPLICATION of locked loads is almost as varied as the use of glue in industry. Stacked freight car loads of varied case sizes and weights have been successfully shipped from coast to coast, as well as loads on expendable pallets.

Wooden cases, domestic corrugated cases, V-board cases and multi-wall bags have been loadlocked and successfully shipped on pallets, with a tremendous saving in shipping, handling and damage costs.

Many large industries have been using this method since World War II, and have found that customers are more than satisfied and are, in fact, demanding locked pallet loads in freight shipments.

Towmotor dumps pot of annealed castings into shakeout hopper at Cleveland plant of Eberhard Manufacturing Co.

BOTTOMS UP!

Here's to TOWMOTOR, the fast and economical way of handling materials! Easy, too, because TOWMOTOR Power Steering reduces steering effort 80%! And speaking of power, the new "Cushioned Power" Diesels are as gentle and economical as ponies—with all the terrific strength of wild horses! There are dozens of other features that make special jobs like the one above, mere routine, and make *your* job twice as important to the boss. Send today for free booklet, "What Makes It Tick?" TOWMOTOR CORPORATION, Div. 6708, 1226 East 152nd Street, Cleveland 10, Ohio.

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DOUBLE-WING BOOM STACKER

3 MILES OF CONVEYOR BELTING move 800 tons of ore per hour

THREE MILES of rubber belt, moving 800 tons per hour over 53 different conveyors, compose the arterial system for Colorado Fuel and Iron Corp., Pueblo, Colorado, the largest ferrous material handling process in the West.

This vast network of belts and pan-type conveyors carries raw materials to and from the ore preparation unit of the CF&I steel mills. Daily trainloads of iron ore from Utah and Wyoming constitute the source of supply for this king-size marvel of mechanical mixing.

Due to the geologic structure of both Utah and Wyoming deposits, the ores, though relatively high in grade, are quite variable in chemical and physical nature.

System

To minimize effects of variable ores on blast furnace operation, a system of ore preparation is applied whereby the ore is properly sized, an adequate portion is screened out for sintering, and crushed ore is blended before charging into the furnaces.

In addition, the ore preparation plant is used for the sizing of limestone for the blast furnaces, dolomite for the open hearth, and refractory materials for general mill purposes.

Now in its tenth year of operation, the ore blending plant at Pueblo was the first of its type in the United States and is considered one of the largest such installations in the world. The only two other similar plants in the United States are at Geneva, Utah, and Fontana, California.

Rapid entrance

Ore is admitted to the plant at 540 tons per hour, dumped from rail cars into a hopper that empties onto an Oro feeder. This metal pan-type conveyor 60 in. wide transports heavy materials a distance of 48 ft. where they are discharged over a scalping grizzly. The over-size then goes to a 48 x 60-ft. Superior-type jaw crusher.

Product from the crusher, together with under-sized, is discharged onto a second Oro feeder, 42 in. wide. This conveyor dumps its materials onto the first of a series of rubber belts which move quietly underground, up steep inclines and through tunnels, delivering their cargoes to the proper place at the proper time.

A flick of a switch can change material direction of flow, by-pass certain operations or fill freight cars.

The first rubber belt travels upward at a rise of 18 deg. for a distance of 86 ft. This 36-in. belt is equipped with a

Weightometer, weighing all materials that pass over it.

After being discharged onto the next 36-in. belt, the load continues an 18-deg. rise for 178 ft. to scalping screens where over-size materials are screened into two 5½-ft. Symons cone crushers.

Product from the crushers, together with the scalped undersize, may, however, take an alternate course. There is a 36-in. belt under the Symons crushers that can carry the material directly into the ore-bedding system on a 172-ft. conveyor, traveling upward at 18 deg.

In case of reversal

If the belt under the Symons crushers is reversed, material is conveyed 189 ft., at a 20-deg. rise to additional scalping screens, the oversize of which is crushed on two 5½-ft. Symons short-head cone crushers. This is employed as the tertiary crushing stage. From this point materials can be sent back to the belt feeding the ore-bedding system, or upwards at an 18-deg. angle to a loading station for dumping into rail cars.

Manipulation of controls on the materials handling system beneath the crushers can also send ore to a surge bin from which it is removed by three 48-in. belts for distribution to three Gyrex screen frames. Final sizing is done on these screens.

Oversize travels to a Geary-Jennings sampling device for an analysis of materials in the blending beds. The next conveyor is equipped with a Weightometer, and after transferring to other belts the material travels 165 ft. on a flat 36-in. belt feeding the two conveyors serving the boom stacker.

Belts serving the boom stacker are 663 ft. in length and flat except for the portion that is tripped over the boom stacker.

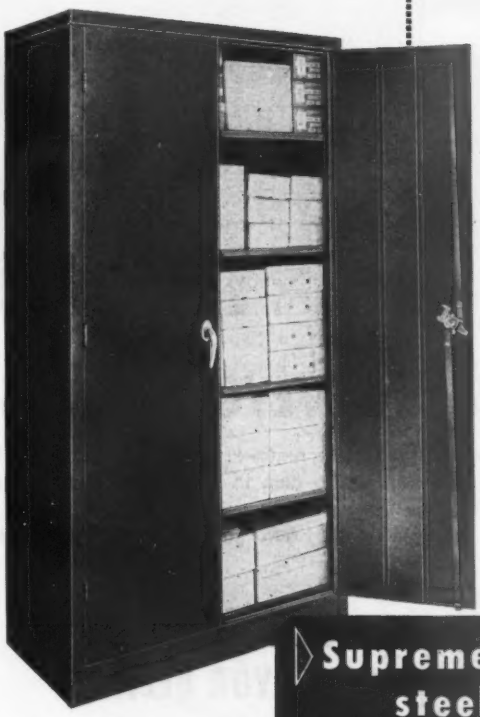
Two wing conveyors on the boom stacker convey materials to the beds at angles varying from flat to 20 deg., elevated in accordance with the height of ore stacked in the beds. The booms are 48 ft. in length.

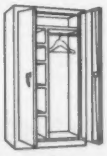
The ore blending plant consists of four 550-ft. beds on which ore may be blended, thus permitting two beds to be used for stacking, while reclaiming is accomplished from the remaining two.

Stacking is accomplished by a double-wing stacker and the reclaiming operation is performed by two Robins-Messiter reclaimers.

Briefly, the stacker by its longitudinal travel lays the ore down in many thin layers on the beds. The reclaimer transversely cuts the ores in nearly vertical planes in performing the reloading operation. The ore is thus

protect supplies and parts





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blended both physically and chemically to an extent that defies detection by the most thorough sampling.

The capacity of the system handling the ore to the beds is 450 net tons per hour and the reclaiming system can handle as much as 800 tons per hour in order to rapidly meet changing requirements of the blast furnace system.

Robins-Messiter reclaimers push materials off the beds by means of horizontal plows onto one of three conveyor belts, each of which is 30 in. wide and 629 ft. long. These belts feed a 341-ft. belt which in turn dumps onto a 180-ft. belt, carrying materials upward at an 18-deg. rise to a loading station from which material is ultimately dumped into railroad cars.

Material is transported from the ore preparation plant to the four blast furnaces at Pueblo by a single-track rail high line and is dumped into 43 bins built in a continuous line. These bins serve four furnaces with all necessary raw materials.

Small stuff

Undersize material produced at the screen sizing station is received on a flat conveyor carrying materials 79 ft. A 358-ft. conveyor rises 19 deg. in a portion of its course, to a series of bins. An automatic tripper deposits the undersize materials in these bins.

From the bins the undersize materials are removed by a rotary plow and discharged onto a 263-ft. belt which rises 19 deg. to a control surge bin from which the material is removed by a rotary table and carried upward by a series of three belts to another surge bin. A 36-in. pan-type conveyor removes materials from this bin and charges the product into pug mills.

After the material is discharged from the pug mills it is carried at a 20-deg. rise for 106 ft. to the head of the sintering machines.

In the sintering process the return fines from the wind boxes are returned to the flow of materials by two 149-ft., 18-in.-wide belts. Further return of fines from the finished sinter is done by an 18-in. pan-type conveyor.

The intricate conveying system also moves fuel for combustion. This is prepared from fine coke developed at the coke plant and blast furnaces.

From a hopper at the ore preparation plant, coke breeze is conveyed on a rubber belt 5 ft. long and 30 in. wide, dumped onto another belt 24 in. wide and 153 ft. long and carried upward at a 20-deg. angle to two 6 x 12-ft. Gyrex screens. Oversize is conveyed to a Marcy rod mill in a closed circuit and the undersize travels over the previously described system to storage bins.

Sinter is removed from the cooling

wharf by a rotary plow onto a 82-ft. conveyor. This feeds a 60-ft. belt equipped with a Weightometer to determine the sinter weight. From here sinter travels upward at an 18-deg. rise for 189 ft., discharged into railroad cars and taken to blast furnaces.

Although there are only three such ore preparation plants now in operation in America, the installation of additional preparation plants to handle imported ores for eastern blast furnace operations is forecast. Exact sizing of ores has proved to be such a boon to blast furnace production that the system may soon be generally adopted for more efficient production.

WHEELS REPLACE skids on logging yarders

WEYERHAEUSER Timber Co. have discovered that they can get greater mobility out of their logging yarders by mounting them on converted railroad wheels instead of wooden skids.

Modern logging operations require frequent moving of this heavy equipment in order to keep up with changing locations of log loading. The cumbersome skids made transport on forest access roads a difficult undertaking.

Railroad wheels, with the flanges burned off, are mounted under the yarders in series of four, 64 wheels to a yarder. The heavy cast-iron wheels provide the mobility desired while maintaining the stability and strength necessary for the riggers.

Originally the flanges were removed by ordinary electrode cutting methods. Use of an Arcair torch, however, not only shortened the time for the job, but also reduced expenses by using only an electric arc and compressed air. The use of railroad wheels with the flanges removed for logging purposes began at Snoqualmie Falls about thirteen years ago. In spite of assurance by veteran loggers that the idea was no good, it has taken hold and is now in use at most Weyerhaeuser branches.

No special bearings are required for the wheels since these yarders are moved infrequently—perhaps 10 mi. a year. Larger wheels are sometimes purchased for this purpose, being 6 or 8 in. higher than rail wheels.

Three major advantages of heavy steel wheels over the old sled-type yarder mounting are: (1) they are mobile, and yet heavy enough to lend stability without the need of anchoring; (2) they do not wear out every two or three years; (3) the wheel-mounted yarders, moved with a tractor, run right out into the brush when they run out of road.

BLAW-KNOX *ELECTROFORGED* STEEL GRATING AND TREADS

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J. M. Moore, 903 U. S. National Bank Bldg., Denver, Colorado

LEFT: One man can do the job of two with this arrangement of nailing machines at the Oakland Naval Supply Center box factory. Worker in foreground, alone, can palletize entire output of four machines.

RIGHT: Turntables around uprights supporting shop roof greatly increase storage space in small shop.

FAR RIGHT: Nailing machines are fed cut-to-size pieces from bins brought from milling section. One man feeds two nailers by way of roller ramps at right of picture. When bin is emptied, turntable is swung to next bin. Fork truck hauls away the empty and brings another full one without interruption.

TURNTABLES MINIMIZE DEAD TIME ON PRODUCTION LINE

DEAD TIME on the production line has been the plague of big and small plants alike, ever since the innovation of mass production. And, it has probably stumped more efficiency experts and plant engineers than any other single problem confronting the manufacturer.

A mechanic must put his tools down to wait for new parts. A machine has to stop while a completed unit is taken away and a new one brought in. There are dozens of such occasions when for reasons beyond his own control, the assembly line worker has nothing to do. It's only a minute here, five minutes there—but it soon adds up to hours and days for which the company is paying good money but getting nothing in return.

One part of the problem—keeping the line supplied with raw materials—has been effectively solved at the Oakland Naval Supply Center box factory, resulting in production increases of as much as 20% and manpower reduction of 50% on some jobs. The trick was turned by clever plant engineering and a unique use of turntables.

A medium-size plant, as box making operations go, the supply center's box factory satisfies the big logistics base's demand for packing boxes—26,000 units a month in two dozen dif-

PUSH VOLUME UP...

...PUSH COSTS DOWN

WITH STANDARD CONVEYORS

Material handling often constitutes as much as 50% of total production cost — cut handling costs and you cut production cost.

More than 45 years' experience qualifies Standard to be of expert service on any "package" conveyor need — roller, belt, slat, chain, push-bar, sectional, portable self-contained conveyor units — spiral chutes — pneumatic tube systems. Write Dept. WI-83.

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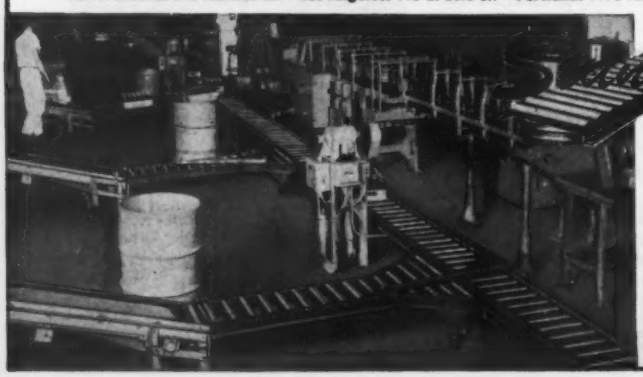

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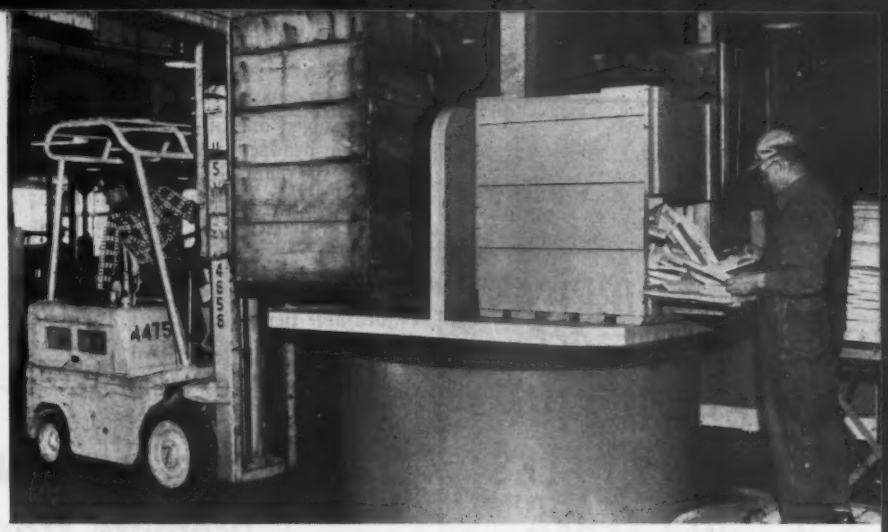

ferent types and sizes. It also produces pallets and storage racks.

Problems pinpointed

As in box factories everywhere, the Oakland plant's production problems centered around its nailing machines. First there was the matter of keeping the machines supplied with cut lumber so the operator could keep working without interruption. Then there was the problem of clearing away the machine's output—palletizing and transporting to storage areas or other machines.

The plant grouped its machines four together in a loose circle. Each two machines are serviced by a roller ramp which brings cut lumber from bins of pieces cut to size. In the center of the circle of machines a turntable revolves continuously and receives the finished units of all four nailers.

Where it had formerly taken one laborer palletizing for each two machines, the turntable now enables one man to handle the entire output of all four machines. In turn, pallets are placed on a turntable for loading. When one is full, the loader simply turns the table to the next without waiting for a fork truck to haul away the full pallet.

Feeding process

Feeding the machines works pretty much the same way. Bins filled with cut-to-size pieces are brought to the head of the roller ramp and placed on a turntable. When one bin is empty the feeder simply turns to the next. A fork truck takes away the empty and brings another full bin with no interruption of feeding.

Incidental to production, turntables

7500 HOURS is a LONG TIME!

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7500 hours means 40 hours a week for over 3 years and 7 months!

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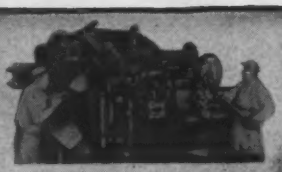

"THIS LUBRICANT INCREASED BEARING LIFE FROM 2 WEEKS TO 2 YEARS"

—says THE GLOBE COMPANY

"Animal acids and moisture, most harmful to ball and roller bearings prevails in the entire meat packing industry. With conventional lubricants, some of the bearings in our Roto-Cut machines did not last two weeks. Since using Ball Bearing LUBRIPLATE in machines operating continuously 24 hours a day for over two years, we have not had a single bearing replacement."

For nearest LUBRIPLATE distributor, see Classified Telephone Directory. Send for free 56-page "LUBRIPLATE DATA BOOK"... a valuable treatise on lubrication. Write LUBRIPLATE DIVISION, Fiske Brothers Refining Co., Newark 5, N. J. or Toledo 5, Ohio.

REGARDLESS OF THE SIZE AND TYPE OF YOUR MACHINERY, LUBRIPLATE LUBRICANTS WILL IMPROVE ITS OPERATION AND REDUCE MAINTENANCE COSTS.

have solved one of the box factory's storage headaches, too. Cramped for space, the plant often had to store cut lumber from the milling section far away from the nailing machines. There was, however, considerable unused space around the uprights supporting the roof of the plant. The shop built turntable tiers around the uprights. A fork truck can get at any part of the stack regardless of the proximity of machinery or other stored material.

Simply and cheaply constructed, turntables have paid for themselves many times over at the Oakland Naval Supply Center box factory. It's just one example of how imaginative plant layouts work to get every possible minute of production out of every man-hour.

ENCLOSED CONDUCTOR BARS promote tramrail safety

CALIFORNIA is the first State to include in its legislation a law requiring conductor bars on tramrails to be effectively isolated, either by elevation or insulation. This comes as a result of numerous severe industrial accidents resulting from uninsulated or poorly installed equipment.

Safety designs

Tramrail manufacturers have quickly fallen into line and many new types of electrification for overhead cranes and tramrail systems have been especially designed with these safety requirements in mind. Developments were planned and carried out in anticipation of possible ruling in the near future by the National Electric Code, making it mandatory to have adequate protection of electrification on all overhead materials handling equipment.

Cleveland Tramrail Division of the Cleveland Crane & Engineering Company have developed and tested the Tramrail Saf-Powr-Bar. This consists of an inverted U-shaped conductor bar inside of which operates a sliding current collector shoe. The bars may be

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Fast loading and unloading. Uniform heat distribution. Maximum operator comfort and convenience. Top quality refractories. Generous insulation. Reinforced steel plate jacket and doors.

SIZE: Takes car 9 ft. x 14 ft. Effective door opening 4 ft. 7 in. high. **COMBUSTION SYSTEM:** Six wide-range nozzle-mix burners on 830 Btu gas 2 to 20 psi, maintain continuous maximum temperature 1850° F. Automatic temperature control and safety shut-off system. Sand seal.

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installed on many hand-propelled systems where motor-powered hoists, carriers or cranes are now desirable. Safety is the big feature of this development, as it prevents contact with an electrified conductor bar.

Sliding current collector shoes contact three sides of the bar and operate on a pantographic principle. Actual tests on installations in the field have confirmed the results of research testing which indicates that the life of a bronze collector shoe is upwards of 2,000 mi. as compared with 400 mi. maximum for a collector wheel assembly.

Insul-8-Bar

Benbow Manufacturing Co. have met the restrictions of this new law by putting out what they call Insul-8-Bar. It is a molded phenolic plastic covering fitting over a figure 8 shaped bar. This installation attempts to do roughly the same job in reducing accidents by insulating three sides of the conductor bar.

Calabar Corp. has devised another type of insulation, also built around a figure 8 type bar. This covering is made of rubber and can be put on in the field as well as clamped on in the factory.

Penrose Covering

The Penrose Covering is another that has been developed for tramrail conductors. It consists of 1½-in. diameter tubing, about ⅛ in. thick. The prime advantage is that the shoe slides through it and the tubing closes behind the shoe, completely enclosing the conductor bar at all times.

The so-called patented conductor bar insulations are feed-rail multiphase conductor and Bulldog trolley-duct insulator. Most patented coverings require factory installation although some can be adapted to existing tramrails.

In order to save costs on these commercially made insulators, numerous smaller companies have adopted plywood, bakelite and masonite to do their insulating jobs.

While California has been the first to legislate for safe tramrail insulation, several other states are considering similar legislation in an effort to promote safer working conditions in their plants.

AWARD OF HONOR

THE U. S. Steel Products division of U. S. Steel Corp., Los Angeles, has received the Award of Honor, the highest award for safety that any industrial plant can win. It comes from the National Safety Council.

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Today, almost every warehouse or plant needs and uses one or more cost-cutting pieces of Wisconsin-powered equipment. And a good reason for such acceptance stems from this fact: Every equipment builder can select the *right* size Wisconsin Engine because of the wide model range . . . single-cylinder, 2-cylinder or V-type 4-cylinder models, 3 to 36 hp. Because the engine is right for the job . . . it delivers better lugging power due to the best relationship of horsepower to torque.

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HERE'S LITERATURE on MATERIALS HANDLING PRODUCTS from the NATIONAL M-H SHOW

Up-to-date info on M-H products and methods, available to Western Industry readers

1

Truck-dolly combination

Line of truck-dolly equipment is described by *American Pulley Co.* in a catalog telling you about an all-purpose appliance truck, endless-belt movers for home appliance delivery, carry-all movers and other types of heavy duty carriers. (Folder Ht-Ak-53)

2

Small but mighty

Big news from *Aro Equipment Corp.* is the introduction of small air hoist capable of lifting 1,000 lb. loads at 40 ft. per min. Company offers complete information in an illustrated six-page folder. 5313-T

3

Arrow conveyor line

Arrow Products offers illustrated catalog on its power and gravity conveyor lines.

4

On-the-spot battery charging

Motor Generator Corp. offers data sheet MGC-95 on the Hobart Universal battery charger. Owners of electric powered industrial truck fleets will find a possibility here for reducing maintenance costs.

5

Low cost conveyor system

Just off the press is this booklet on *United States Spring & Bumper's* new light capacity overhead conveyor. Pictures and drawings explain the principle of this low cost system and directions are given for ordering equipment.

6

Take it up with R&M . . .

. . . is the invitation extended by *Robbins & Myers* who offers three bulletins covering motor-driven trolley hoists, dual-duty hoists, and electric hoists and cranes. If you're in doubt which system is best for you, you'll be interested in this comprehensive coverage of the subject. Bulletins 805A, 880, 801C.

7

Is the power source good?

Of interest to the man who must pass the final okay on the purchase of a conveyor system, truck or hoist will be the booklet entitled "A Continental Engine is Built for the Job." Booklet explains why Red Seal motors, used by many materials handling manufacturers, is a reliable source of power. *Continental Motors Corp.*

8

How to spot freight cars

For the company dealing in carload shipments, *Frank G. Hough Co.* describes, in a case history folder, its powerful Payloader tractor for car-switching and general drawbar work.

Use rip-out postcard for your free M-H literature

9

Battery information

Edison Storage Battery division of *Thomas A. Edison, Inc.*, offers a 35-page introduction to the subject to engineers and others whose work brings them into contact with the multiple range of battery uses. Valuable information also for the owner or operator of battery-operated truck fleets.

10

Bulk material handbook

An unusual offering is the *Frank G. Hough Co.'s* 41-page guide to improved methods for moving and handling non-packaged materials. Revising or building a new system, operator training, maintenance, record keeping and other subjects covered. Tables include weights and measures of various material and conversion figures.

11

New improvements on Carscoops

The *Butler Bin Co.'s* model 102 Carscoop, with its increased forward speed, and model 203 which "turns like a top" for loading in cramped spaces, are described and illustrated in two bulletins (250B, 250C) offered by the company.

12

Moving on wheels

Comprehensive catalog S-53 on truck casters, wheel mountings and position locks is offered by *Bassick Co.* Specification tables, given for each type, make replacement selection easy.

13

Goodbye to clogged bins

Gerotor May Co. claims Pneu Bin pulsating panels are only device producing positive large amplitude movement of bin and hopper contents. Folder, offered to support statement, explains working principles and installation detail.

14

Machine feed table literature

Hydraulic airfoil or oil-electric machine feed table, push-button controlled, caster mounted for portability, is described in illustrated leaflet offered by *Globe Hoist Co.* Company will also send you information on its R-68-E extendable self-leveling ramp.

15

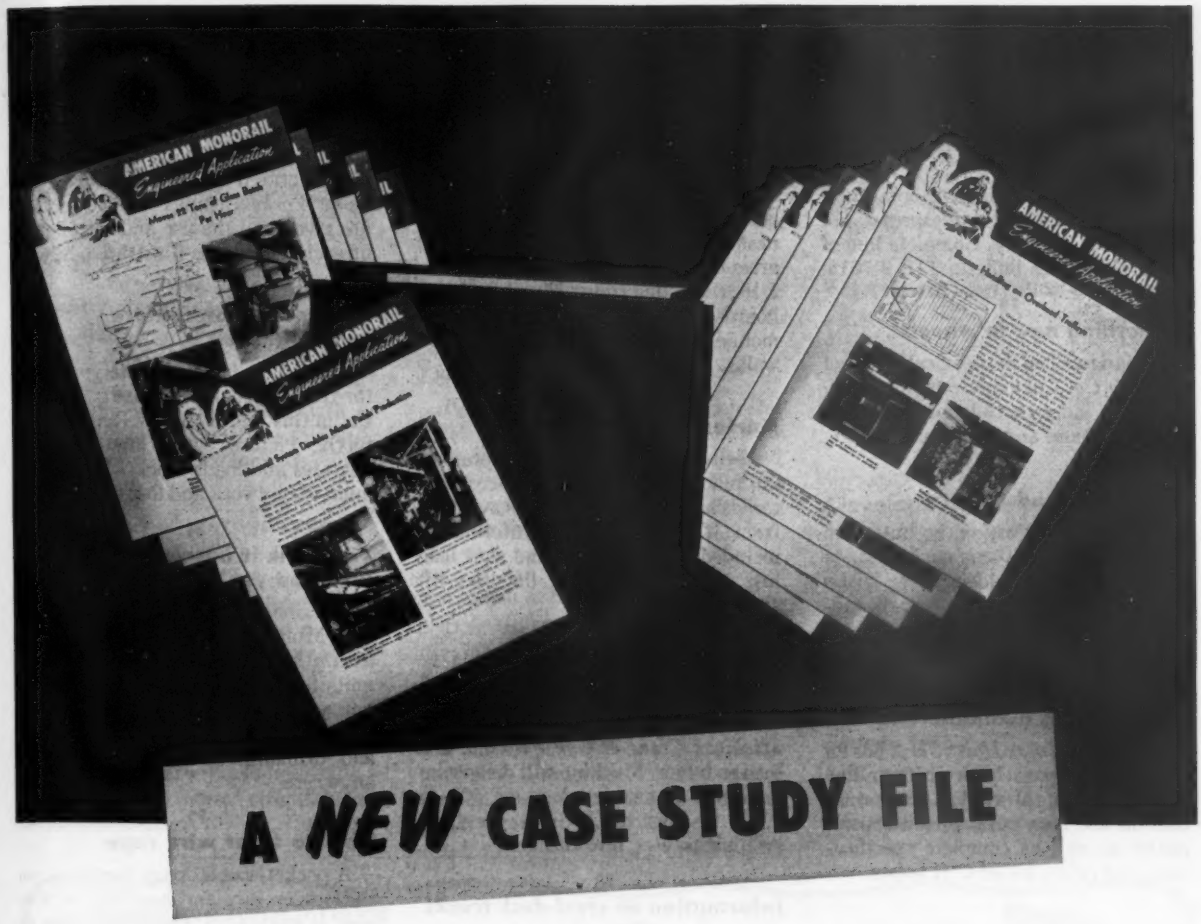
Vibrating conveyor without high power cost

Vibrating conveyor line, which uses natural frequency of springs to produce vibration, thus cutting high operating cost, is described and liberally illustrated in Bulletin 111 by *Carrier Conveyor Corp.*

16

Unit conveyor described

Flexibility is keynote of *Conveyor Specialty Co.'s* Unitable conveyor system. Company offers folder describ-



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FOR LOW COST HANDLING

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(Please attach to, or write on your business letterhead)

ing its unitized belt system, with companion literature showing the readily-assembled combinations possible from standard stock units.

17

Ford branching out

Ford Motor Co. is developing new units designed for widespread use throughout industry. Complete line of motors shown in bulletin TIE 9-7015.

18

Something new in wheels . . .

. . . is described in specification sheet by *Dico Co.* Company now manufactures an indestructible pressed steel wheel for hand and floor trucks.

19

Look—no hands!

No manual adjusting, no button to push, announces *Dockboards Inc.* in this specification folder on its Hi-Lo dockboards. Truck automatically adjusts the ramp—releasing a dock attendant for more productive work.

20

Hoist catalog available

Chisholm-Moore Hoist Corp. has an attractive 18-page book on their line of Comet hoists. Included is information on the new push button control model as well as complete specifications and prices for all C-H hoists.

21

Crane scale improvement

Claiming the first major advance in crane scales in 25 years, *A. H. Emery Co.* has a folder 521 outlining the advantages of its product which is available in 3 capacities—10,000, 5,000 and 2,000 lbs.

22

Racks without bolts

Easily erected pallet racks, without bolting or welding, are manufactured by *American Metal Products Co.* and it has a descriptive folder and engineering data sheets ready to tell you about them.

23

Rapids-Standard guide

An attractive 28-page catalog is available from *Rapids-Standard Co.* entitled "Material Flow is Bloodstream of Business." As implied, book covers complete line of gravity and powered conveyors and hand trucks.

24

Magnetic conveyor

Increased assembly efficiency is described in a folder and application sheet made available by *George Koch Sons.* A flat top assembly table, powered by magnetic conveyors, has no breaks in surface for parts to drop through or assemblyman to injure fingers on exposed machinery.

25

Information on magnesium line

Magline Inc. has a series of folders of interest to materials handling people realizing the value of lightweight magnesium equipment. Bulletin HT-101 gives hand truck information; bulletin DB-204R describes Magliner dock boards; and bulletin DB-211 covers mobile loading ramps, bridges and catwalks.

26

Marforge catalog

Well-illustrated broadside presenting full line of Marforge low-cost materials handling equipment is available from *Market Forge Co.* Information included on pallet load and skid load lifts, tractor, and fork, lift, tier lift and freight trucks.

27

Unusual equipment described

Introductory information on a heat-treat furnace loader is offered by *Michigan Crane & Conveyor Co.* in a 4-page folder. Machine will deliver indefinitely a metered load of 500 to 4,000 lbs. per hr. of bolts, forgings, strappings, etc., into furnace.

28

Information on steel-deck trucks

Milwaukee Truck & Caster Corp. has a specification sheet for those of you who are interested in a medium duty steel deck platform truck. Featured is a narrow deck truck for use in limited working space.

29

Show-stopper in Philly . . .

. . . was reported to be the "walkie type" trucks manufactured by *Moto-Truc Co.* Company has bulletin 53 which comprehensively describes all the models in this line.

30

C&D tells you about batteries

Motorized lift truck owners know the importance of batteries in their equipment. *C & D Batteries,* specialist in this line, tells you what to expect from a battery and also will send you a specification folder on its top-grade Slyer-Clad cell unit.

31

Ramp data

Popular exhibits at the Show were loading ramps, and *Rowe Methods Inc.* describes its automatic adjustable model, complete with installation instructions, in a 4-page illustrated folder.

32

Hydraulic cylinders for farm and industrial use

A series of four booklets give complete information on operation and advantages of hydraulic cylinders manufactured by *Turlock Iron & Machine Works.* Listings of price and size are given and the use and installation of each cylinder is illustrated. 526

33

Information on remote control truck

Let radio control operate your tractor-trucks, suggests *Barrett-Craven Co.* in this folder on new Radox TractorOx. Pictures show how one man operates and loads truck with a minimum of footwork and lost time.

34

You think it hasn't been invented yet?

A frame, that is, to meet your need. The Mult-A-Frame division of *Ainsworth Mfg. Corp.* uses three basic units to show in this broadside folder how you can construct any size, shape or angled unit. Frame easily erected and dismantled for trouble-shooting anywhere.

35

How to treat wire rope

A pocket-size 80-page handbook on the proper care and handling of wire rope is offered by *American Chain & Cable Co.* Liberal illustrations supplement descriptive text to cover every phase of wire purchasing and maintenance.

36

Portable conveyor unit described

Alvey-Ferguson "LiveRail" wheel conveyor line is described and illustrated in an 8-page folder. The portability of this line makes it highly satisfactory where conveyor placement varies from job to job.

37

Truck hoist information

Hoist a half ton with the touch of a finger and the power of a truck battery states *Rushlight's Inc.* describing its portable truck loading hoist in this bulletin showing the hoist in actual working examples. Hoist can also be used on dolly. Price leaflet included.

38

Machinery time clock

Much valuable time is lost by machinery and *Service Recorder Co.* suggests you learn how much in order to utilize the maximum working efficiency. Comprehensive booklet explains how unusual time clock works. Of interest to lift truck owners is sec-

ond folder showing the application of Servis Recorder to their equipment.

39

Space saving system

NewTier system, boxes which nest when empty and tier for compact material storage when full, are described in a well-illustrated folder offered by *Chas. Wm. Doepke Mfg. Co.*

40

Economy truck described

A well-illustrated catalog is offered by *Knickerbocker Co.* on its low-cost horizontal material Truck-man. Featured is the high lift model, as well as the various other models in this line. Specifications included for each.

41

Running out of storage space?

American Monorail Co. recommends a stacker crane, in its bulletin AMS-1, where selective and accessible storage is necessary. Crane makes possible using space near ceiling of warehouse.

42

"Keep Your Production Lines Moving" . . .

. . . urges *Stanley Works* in this illustrated folder on power strapping for crates and shipping cartons. Company will also include a sheet on its new controlled power, electric skid magazine tool.

43

Elwell-Parker catalog

Condensed catalog of *Elwell-Parker Electric Co.* equipment is now available from *Ira G. Perin Co.* Essential information on industrial motors, controllers, low and high lift trucks, fork lift trucks and cranes is given in text and pictures.

44

Tailgate equipment folder

Brown-Line Corp. has a colorful folder on the Palevator hydraulic tailgate. This equipment is recommended where loading space is limited or where pillar supports makes other handling methods impossible.

45

Versatile is the word

Described as industry's most versatile production and parts storage equipment, *Bethey Manufacturing Co.'s* pressed metal pallets and storage adapter units are pictured in every size and shape combination in this 20-page book. Equipment can also be used for either temporary or permanent assembly tables.

46

Wire cloth slings

Pictures of the Gripper flexible metal slings in actual working positions appear in bulletin 104 offered by *Cambridge Wire Cloth Co.* Examples include slings for heavy armature, pickling steel tubing, coiled strip, tube bundles, etc.

47

Voluminous conveyor catalog

386 page spiral bound catalog of diagrams, application data, rating tables and specifications on gravity, power and special conveyor machine. (Catalog HB 53, *Mathews Conveyer Co.*)

48

Cleveland Crane particulars

Cleveland Crane & Engineering Co. presents a wealth of engineering and application data in a 12-page book on its line of overhead materials handling equipment. Items discussed include: rails, switches, carriers, cranes, hoists, grabs and buckets.

49

Sturdy truck

Rough terrain material handling problems are solved when you use Westcoaster utility loaders state *West*

BARRY STEEL SPLIT PULLEYS

Scientifically designed. Electrically welded. Light weight. Easily installed. Maintains exact shape under all loads.

DICK'S BALATA BELTING

Hard surface, closely woven duck, thoroughly impregnated with Balata Gum. Free from stretch and shrinkage. Moisture resistant. High in power transmission efficiency.

WHY THE Dick LINE BOOSTS PRODUCTION...SHRINKS COSTS

Barry Conveyor Pulleys . . . Barry Steel Split Pulleys . . . QD Quick Demountable Sheaves . . . and Dick's Balata Belting shrink maintenance costs because they're constructed for efficient, economical, rugged service. Feature by feature, each item of the Dick line is carefully engineered to boost production through maximum strength and long-term durability.

BARRY CONVEYOR PULLEYS

Combines light weight with super strength. Welded steel construction. Easily installed. Wide range of sizes for all general conveyor services.

DICK ROPE

QD—*Quick Demountable*—SHEAVES

A new sheave for new applications and modernizing old equipment. Advance design permits easy installation and removal without driving or pulling. Sheaves grip shaft over entire length, eliminating wobble and loss of concentricity.

R. & J. Dick COMPANY, INC.
PASSAIC, N. J.

SAN FRANCISCO, CALIF., 510 BRYANT ST.
SUTTER 1-1341

SEATTLE, WASH., 307 MARITIME BUILDING
MUTUAL 1922

Coast Machinery Inc. in this folder on its model 200. Pictures of truck in use and specifications are included.

50

Truck loader

Brooks Equipment & Mfg. Co. offer an attractive, illustrated pamphlet on the Loadlugger, truck mounted bulk and pallet handling equipment. Selection chart included.

51

Meet truck of the future . . .

. . . is invitation of *Clark Equipment Co.*, who will send you the issue of its Material Handling News describing the experimental model 70. Book also serves as condensed catalog of Clark's full line.

52

Lit on new truck

The power and efficiency of the torque drive has been added to the fork lift truck by *Towmotor Corp.*, who has a colorful, well-illustrated book SP-12 available on the "Towmo-Torque."

53

Spanmaster catalog

Angelus Engineering Corp. is offering 44 pages of specification data and catalog material, in an attractive cover, on Spanmaster cranes, trolleys, runways, etc. A Coast source of supply.

54

Cleaner, safer air unit

Wherever gasoline engines are used indoors, the OCM exhaust means safer performance states *Oxy-Catalyst, Inc.*, in this folder offered to our readers. Company also has folder on Oxycat, a catalyst to oxidize organic and combustible materials.

Use rip-out postcard for your free M-H literature

55

Literature on lift table

Century Products Co. introduces model 1000, mobile hydraulic lift table, in this illustrated pamphlet. Complete specifications given.

56

Electric crane scale

A crane scale, with only an electric cable between the load-sensing element and the recording instrument thus making possible remote indication and recording of weights, is featured in *Baldwin-Lima-Hamilton Corp.'s* bulletin 4105. Illustrations and engineering data given.

57

Speedways conveyor system . . .

. . . is described in a 2-color, 12-page catalog 852, which illustrates this line of gravity wheel, gravity roller and power belt conveyors. Recommended uses, engineering data and specifications are given. *Speedways Conveyors, Inc.*

58

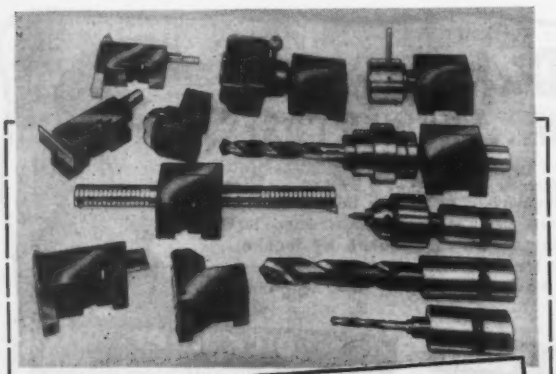
Communications and materials handling

Radio Corp. of America has two bulletins of interest to materials handling people: one bulletin entitled "2-way Radio for Transportation" for remote communications with trucks, etc.; the other, "Mobile Industrial Radio" which describes the equipment for communication between a central office and fleet of fork lift trucks, etc.

59

Tire information

Saginaw Products Corp. recommends its line of industrial pneumatic wheels and tired casters for any application where speed, silence and minimum vibration are essential. The company has a catalog showing the wheels



truly versatile... KDK BAR ADAPTABILITY

This photograph shows how the "truly versatile" K D K Tool Holder Bars can be used. Standard set of bars with Box Tool Die head and Quick Change chuck with adapters are being used in Master Bar.

Five bars will hold nine tools and permit 24 combinations thus saving set-up time.

The quick change of bars has increased production up to 400%.

Los Angeles: Almquist Bros. Marshall Tool & Supply Corp. Electrolizing Sales & Tools, Inc.
San Francisco: Joseph E. Fletcher
Seattle: Starbuck Machine Corp.

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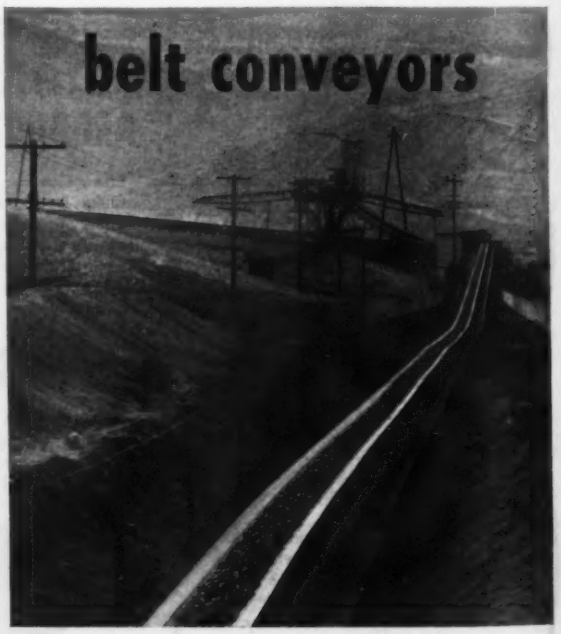

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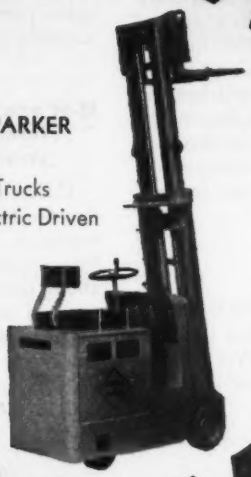

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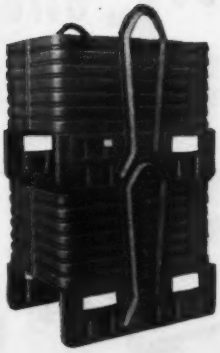

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available for either straight or end axle adaptation, with instructions for ordering.

60

Hyster accessories catalog

Hyster Co. is offering a 24-page catalog of attachments, tools and accessory items for its line of industrial trucks and cranes. Also available is a folder on the Swing-Shift unit which increases the versatility of Hyster models XA-60 and ZA-80 lift trucks.

61

Gravity roller conveyor data

What makes the "Streamliner" gravity roller conveyor system tick is amply described and illustrated in bulletin 100 from *Harry J. Ferguson Co.* Twenty pages of pictures and specification data.

62

Electrifying your carrier system

Insul-8-Bar Trolley Systems has a catalog 83 which explains how to electrify your present crane, monorail and conveyor system economically. Also available is a folder HS-3-1 on the company's heavy duty mobile electrification system.

63

Put the final "touch" . . .

. . . to fully automatic materials handling with a Flexi-switch recommends *Jervis B. Webb Co.* in this folder describing the limit switch for conveyor operation. Flexi-switches are available for coordinating operation of a series of machine tools; synchronizing speed for a number of conveyors or for operating automatic stops, feeders and transfers.

64

Upright conveyor

A data sheet 53-B from *Anchor Steel and Conveyor Co.* describes the upright-return fixture conveyor which will keep material upright on any size pallet or load.

65

Folder on Hydroscale

Hydroway Scales, Inc., has a colorful 8-page folder on the Hydroscale, hydraulic crane scale. Illustrations show scale in various uses and specification data is included.

66

Package conveyor

Speedy, gentle handling of your packaged products is offered by *Oliver Corp.*, who offers a bulletin (400) to tell you why, when you use the Farquhar power-belt and gravity package handling conveyor.

67

M-H equipment "... light like a feather ... strong like an elephant"

Here is a fine folder with each page devoted to a particular kind of Tobey materials handling equipment—pictures, specifications and a kind word about them are all included. Devices touched upon include: trailer train; baggage and cargo truck; flat bed truck and ramp; ordnance handling, platform, and box trucks; work table; and tote box. *Tobey Manufacturing Corp.*

68

Tire that gives battery-powered trucks a big lift

The Monarch Rubber Co. releases an information folder about its new efficiency solid tire specifically designed for electric-powered trucks. Folder outlines advantages, testing procedures, results, questions and answers about this tire.

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Now...for a good shower

—deep freeze!

—scalding hot!

BANISH "BOOBY TRAP" SHOWERS

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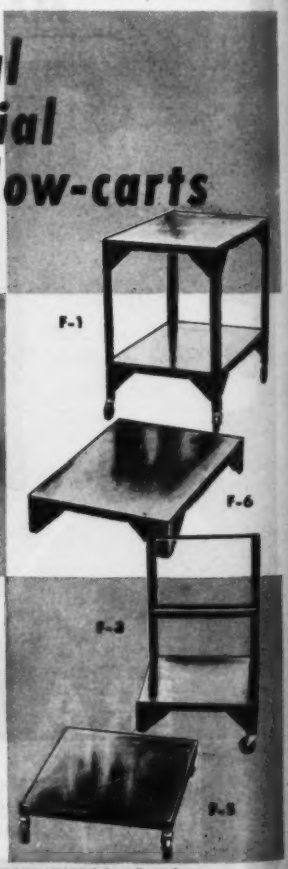

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69

To help you pick a cable conveyor

Compact four-page Bulletin 40 published by *The E. W. Buschman Co.*, gives story on three types of power-driven cable conveyors: Buschman ¼-in. and ⅜-in. cable "Universal" trolley conveyors and Buschman table-cable conveyor. Load limits, carrier spacing, beam specifications, are among data given. Sketches show Buschman Snub-Lock and Bush-Lock designs used in these conveyors.

70

"Here's how" for bulk chemical and food packers

A six-page bulletin pictures, diagrams and explains *Richardson Scale Co.'s* new bulk packing and handling system which uses collapsible giant Bulk-Pak boxes. Bulletin shows with textbook clarity, loading, packing, strapping and unloading methods developed by Richardson. 0153

71

MANhandling packages adds costs

New booklet by *Alvey Conveyor Mfg. Co.* shows application of engineered package handling systems in different types of industries, to increase efficiency and cut costs. Form 2591

72

Magnesium dock ramp

Advantages of light weight magnesium for ramps are described in this folder from *National Light Metals & Plastic Co.* Quotation sheet is included.

OTHER LITERATURE

73

Guide to toggle switches

Toggle switch catalog No. 73 gives good coverage of its subject matter with photographs, drawings, and charts. Headlines include: toggle switches, single pole-bushing mounted, single pole 3-hole mounting; multiple-unit toggle assemblies; micro "subminiature" toggle switches; and hermetically sealed precision toggle switch. *Micro, a division of Minneapolis-Honeywell Regulator Co.*

74

Equipment engineering by K-K

This brochure, generously illustrated with photographs of typical jobs, explains services of *King-Knight Co.*, manufacturers, distributors and

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WESTERN INDUSTRY

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installers of electric generating equipment, high vacuum pumps and automatic control equipment. In its eight pages, over 15 pieces of equipment are photographed and described, supplemented by information on King-Knight's other services to customers.

75

Advantages of fastening insulation with steel strapping . . .

. . . This is subject matter of *Acme Steel Co.'s* newest bulletin. Entitled "Steel Strapping Fastens Insulation Firmly," bulletin describes how steel strapping tensions evenly around insulation, keeps seams tight, helps to prevent formation of destructive moisture and speeds up difficult jobs without cutting into or marring insulation.

76

A tool holder in operation

Complete with price sheet, this folder will give you a low-down on time saving with KDK's versatile tool holder. Pictures, diagrams and specifications complete products's story. *KDK Products.*

77

Bulletin on new rosin core solder

A 4-page bulletin, describing a new rosin core solder known as RTS 200, is available from *American Smelting and Refining Co.* Publication describes five ways in which this new product is claimed superior to ordinary rosin core solders. No. 158.

78

A "powerhouse" of information

Lynn Engineering & Supply Co. offers a folder on its four-cycle, handportable Lynnco Powerhouse, a low cost gasoline engine electric generator plant. Seven reasons why firm feels its product to be a best buy, plus specification reference, pack this sheet with information.

79

Restful color chips

Form No. 125 is a new 6-page color-chip folder, just released by *Rust-Oleum Corp.,* illustrating firm's restful color group for plant interiors and machinery.

80

Guide to electrical wires and cables

A substantial, wire-bound book on Bronco electrical wires and cables comes from *Western Insulated Wire Co.,* telling all about these products and including specification charts. A table of technical data on solid copper wire is included.

USE RIP-OUT POSTCARD for more information on products introduced this month.

NEW MATERIALS & EQUIPMENT

81

Prevent accidents with light bulb changers

It's no longer necessary to break your neck in order to change that out-of-reach light bulb. By using lightweight aluminum sectional poles with proper bulb changer attachment on end, you can remain safely on ground or floor and switch bulbs, even broken ones, that are 42 ft. and more above floor level. By inserting unexpanded end of one pole into expanded end of another you can build any desired length of pole. *J. B. Sebrell Corp.*

82

Rubber bumpered trailer for institutional use

A 2,000-lb. capacity, pneumatic tired trailer, for institutional use, features a non-marking, white rubber bumper which surrounds frame to prevent damage to doorways, walls or projections. Roller bearing wheels permit easy rolling. Hospitals, hotels, and state and municipal institutions can use trailer for internal handling of food, equipment, laundry, supplies, etc. *Mercury Manufacturing Co.*

83

Light-weight strapping unit frees both hands

Beltbinder, a complete strapping unit, weighing only 10 lbs., 10 oz., that fastens around the waist by means of a belt, has been developed by *A. J. Gerrard & Co.* It is designed to carry strapping, tools and seals to difficult or distant points. Device includes three containers suspended from a belt in convenient positions with even distribution of weight. One holds a carton with a 200-ft. coil of strapping; a canvas pouch holds a strapping tool and a supply of seals; and a hammer cutter is held in a leather pocket.

84

Steel strapping kit can be carried from job to job

Utilikit is a self-contained steel strapping kit which can be carried from job to job in plants, shops, storage yards, etc. It contains a 300-ft. coil of steel strapping in a cardboard dispenser, 1,000 strapping seals and three basic tools: stretcher, sealer and snips. Ideal for small-volume users. *Brainard Steel division of Sharon Steel Corp.*

85

Pilot-operated valves are new additions to line

Pilot operated four-way slide valve is a recent addition to Nopak line of air control valves. Model "V" valve can be pilot operated by cam, hand or foot control poppets, or by solenoid pilots. All-aluminum construction makes valve light in weight. It is simply designed and adaptable. *Galland-Henning Manufacturing Co., Nopak division.*

86

Book rack for drying process

This portable book rack is made for use by manufacturers for drying or curing sheets or material, or where parts must be separate. Shelves can be raised or lowered easily and are automatically held in position by sturdy extension springs. They are made to your specifications with specified distance between each shelf and are constructed to carry weight required. *Palmer-Shile Co.*

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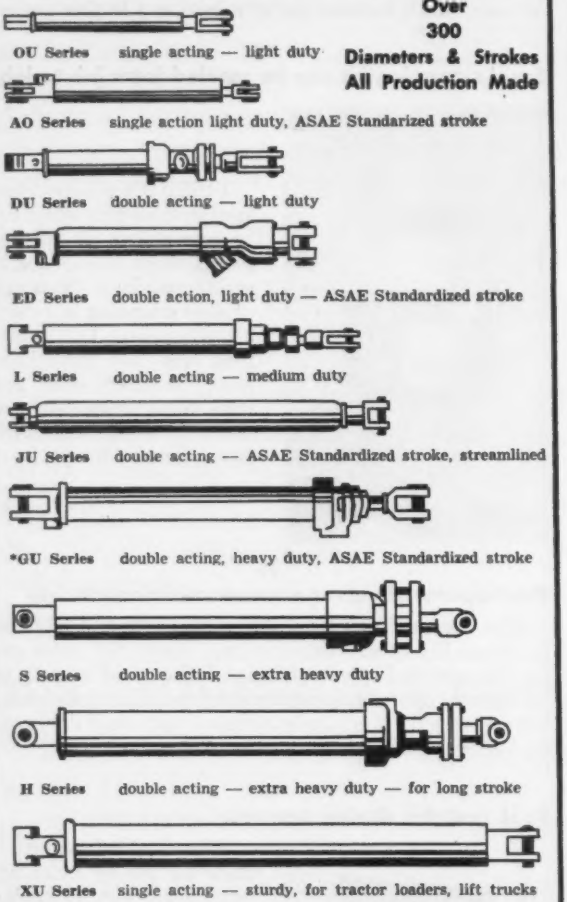

OU Series single acting — light duty

AO Series single action light duty, ASAE Standarized stroke

DU Series double acting — light duty

ED Series double action, light duty — ASAE Standardized stroke

L Series double acting — medium duty

JU Series double acting — ASAE Standardized stroke, streamlined

*GU Series double acting, heavy duty, ASAE Standardized stroke

S Series double acting — extra heavy duty

H Series double acting — extra heavy duty — for long stroke

XU Series single acting — sturdy, for tractor loaders, lift trucks

*Depth stops (stroke regulators) available as an extra for GU Series cylinders.

HyPOWER Cylinders are PRODUCTION MADE.

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Because of HyPOWER'S proven reliability — heavier shafts, welded construction and their exclusive hydraulic seal (U-CUP packing), more and more Western and Mid-Western manufacturers now use HyPOWER Cylinders.

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Turlock Iron & Machine Works
TURLOCK, CALIFORNIA

87

One-way switches with snap action

Two new precision snap-action switches, designed for one-way actuation by cams, dogs or slides, boast of spring loaded, hinged roller arms actuators. One design has a 3/16-in. diameter roller and one has a 3/8-in. diameter roller. Each is available with either solder lug or screw terminals. Contact arrangement of both switches is single-pole, double-throw. *Micro, division of Minneapolis-Honeywell Regulator Co.*

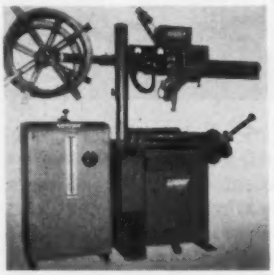
88

Six-cylinder engine incorporates engineering advances

Latest in a new series of high-powered engines for truck and industrial services is a six-cylinder engine which can be built to operate efficiently on gasoline of various octane ratings or on L.P.G. fuels, such as butane and propane. An outstanding feature is unit construction of engine permitting replacement of cylinder block and pistons within a period of a few hours at a nominal cost. *Hall-Scott Motor division, ACF-Brill Motors Co.*

89

An automatic welding machine gains usefulness



Four features, that greatly increase its usefulness, are new additions to model 550 Leader automatic welding machine. These include a new, automatic self-adjusting high frequency arc starter and stabilizer device which has no moving parts and permits use of low density current. Especially helpful is new finger-tip controlled reversible, variable speed drive control for work-handling motor. This simple unit operates without vacuum tubes, keeping maintenance to a minimum. *Leader Welding and Manufacturing Co.*

90

All-magnesium mobile loading ramp

Magline Inc. has begun production of an all-magnesium mobile loading ramp designed primarily for use in facilitating yard cars loading. Mobile ramp, it is stated, makes possible full utilization of power trucks in loading operation. As a result, costly hand loading methods can be eliminated, while car-spotting and demurrage expense can be greatly reduced. Combining strength of magnesium with its extreme lightness, this ramp is engineered to support loads of 13,000 lbs. per axle.

91

Magnetic control lift truck

Lewis-Shepard is offering the new Model 59, 2,000-lb. capacity forklift truck. With magnetic controls, operator

can throw speed lever full speed forward and get a smooth, automatically timed acceleration through each one of four forward speeds. Selection of each individual speed setting is eliminated without damage to motor or gearing.

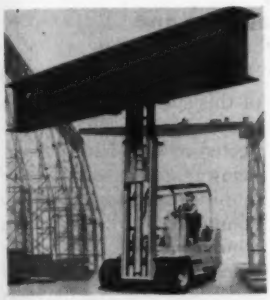
92

World's largest tractor

Allis-Chalmers Manufacturing Co. offers to industry its HD-20, a 6-cylinder General Motors diesel engine having 175 net hp. This tractor is easily controlled and has a hydraulic torque converter instead of a conventional engine clutch. It can travel up to 7 mi. per hour. Buckets of one to four cu. yd. capacity for moving bulk loads or for picking up and loading into other vehicles, along with various types of forks for picking up, lifting, loading or piling, are available for these units.

93

A new stacker transveyor for crowded areas



A new electric industrial truck, Stacker Transveyor, produced by *Automatic Transportation Co.*, is a compact stacker designed for use where narrow aisles, close quarters and limited floor or elevator space are factors. This basic model handles 2,500-lb., 48-in. loads and is available with two mast heights, 68 and 83 in., providing 102½ or 132½ in. of telescopic lift. This battery-powered truck has four wheels with 3-point suspension.

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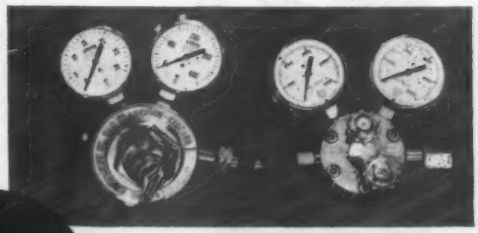

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6

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WORM DRIVE HOIST

Safer, smoother, faster action features of ElectroLift will keep your materials and loads moving economically. One-man, quiet operation. Wide selection of speeds, capacities and controls.

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ElectroLift, Inc., 30 Church St., New York 7, N. Y.

West Coast Representatives
GRETHER & GRETHER, P. O. Box 47, Stockton, California

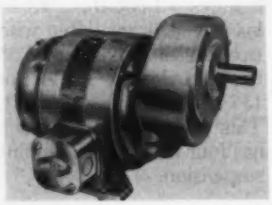
94

For faster manual-handling of palletized loads

Model 1027 is a new Nutting bag truck for cement and other bagged products on low height pallets. It is said to handle unit loads of eight to 10 bags at a time with no tipping of load to insert or withdraw nose when loading and unloading. Two sets of wheels provide a two-stage fulcrum for easier "breaking-back" of load into wheeling position. Among its construction features are steel legs which will stop handle breakage. *Nutting Truck & Caster Co.*

95

Speed reducer provides mounting and power-take-off versatility



By simply rotating endbell of this speed reducer, unit's output shaft can be connected to load either above, below, right or left of drive motor. Feature is claimed to eliminate cost of fabricating mounting platforms; assure true, in-line hookups and contribute to compactness when designed into original equipment. Motoreducer is termed a single reduction unit in that it converts motor's conventional high speed into a low-speed, high-torque output in one step. *Reuland Electric Co.*

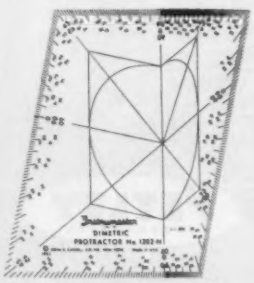
96

New line of fork lift trucks

A new series of 106-in. wheelbase fork lift trucks have been added to the *Gerlinger Carrier Co.'s* line. "S" line, with lift capacities of from four to eight tons, completes a series begun two years ago. New series offers exclusive counteractive weight distribution assuring perfect balance over rough roads regardless of load-size variations. Fifty-four per cent weight remains over front wheels while stationary load axle absorbs all dead load weight.

97

New dimetric protractor



This protractor contains dimetric graduations both for 1:1 plane and two 1:.632 planes. Each graduation covers 180 deg. total, numbered between zero center and main reference line from 0 to 90 deg., clockwise and counterclockwise. In addition, a second set of all numbers is provided, printed in reverse, to facilitate reading if instrument is used in reverse position. *John R. Cassell Co., Inc.*

98

For checking all aspects of micrometer accuracy

Designed for checking one and two-in. micrometers, this set of linear and optical standards permits various aspects of micrometer accuracy to be checked rather than just that of calibration. With new set, for example, it is possible to check squareness of spindle and anvil faces with respect to spindle axis. Included are three gage blocks, .2500, .6500 and 1.000-in. respectively, which may be used individually or in combination for taking accuracy of micrometer screw at various points in its travel. *The DoAll Co.*

99

Adjustable bin units have wide application

Here's a happy solution for storage and display of parts or packaged items. Each shelf adjusts vertically, making space available for items of all sizes. Several available bin models offer different divider arrangements to provide various sized openings. Some come with shelf boxes, especially designed for small quantities of small parts, nuts, bolts, washers, etc. Units come ready-for-use and are finished in Lyon Green baked-on enamel. *Lyon Metal Products, Inc.*

100

Universal tilt belt grinder

Model TBG 5-8-107 is a machine designed and engineered to do rugged roughing and accurate finishing on varying bevel parts, as well as face finishing of parts with angles up to and including 30 deg. open or closed. Its design

SULPHURIC ACID
for the west
66° BAUME 20%
98% OLEUM
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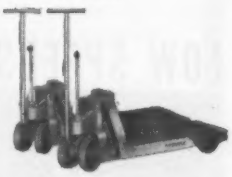
Unbreakable Forgeweld Casters are engineered by SERVICE . . . for service—year after year. Roller bearing wheels and double-row ball bearing swivels assure easy action. Available with steel or floor-protective wheels—sizes and types to fit all needs.

SERVICE
HYDRAULIC LEVERLIFT FLOOR TRUCKS

SERVICE Leverlifts ease lifting and moving skid or pallet loads up to 6000 lbs. Feature all-welded, steel construction, hydraulic lifting and smooth-rolling running gear . . . many capacities, platform styles and sizes. NEW model, especially designed, simplifies handling of double-faced pallets.



SERVICE LIFTABLE

The SERVICE Liftable is a *hand truck,* rolling easily on Forgeweld Casters and Wheels. It's *a lifter,* handling a ton with a few turns of a crank. It's *a work table*—adjustable and portable with a sturdy steel top, 26" x 43" top raises from 28" to 42" —2000 pounds capacity.

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It's the fork lift truck so good that military needs take all we can make. Soon, we hope, you will be able to buy it again—the best truck for most jobs in most plants. Keep MoTowLift in mind!

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Versatile design permits most Service Lifting Equipment to be made up as low-cost semi-specials to suit exactly *your* specific needs.

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is said to emphasize sturdiness, accuracy, ease of operation, maintenance accessibility, and long life of moving or bearing parts. *Sierra Machinery Co., Inc.*

101

New line on straight edges

A new line of straight edges produced from black granite in lengths up to 48 in. is now being manufactured. They are for precision measurement and checking of surfaces of machine tool beds and areas where absolutely flat surfaces must be checked, with accuracies up to 0.00005 in. Material is temperature-inert and its characteristics of stability insure against warp and deflection. Surface is said never to corrode. *Collins Microflat Co.*

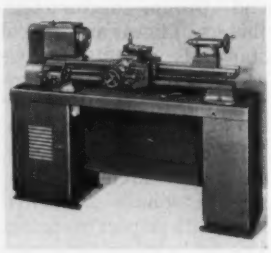
102

Heavy duty forkloader

A new 4-wheel-drive Forkloader with 5 speeds forward and reverse, has been designed for heavy duty operation on rough terrain, mud, snow and sand. Designated the 60N series, the new Forkloader has a lifting capacity of 6,000 lbs. Use of positive 4-wheel-drive and large, low-pressure high-flotation tires increases effectiveness on nearly any operating surface. A 100-in. wheelbase provides anti-roll stability. *Baker-Raulang Co.*

103

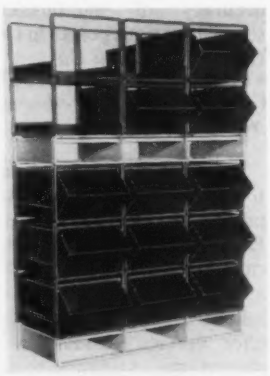
12-in. lathe handles high speed production runs



New 12-in. Logan lathe boasts many features: a heavy headstock; double V-belt outboard drive; massively proportioned, ball bearing mounted spindle; and precision-built carriage. Lathe is said to hog out heavy cuts, handle high speed production runs, and hold sensitive tool room tolerances. *Logan Engineering Co.*

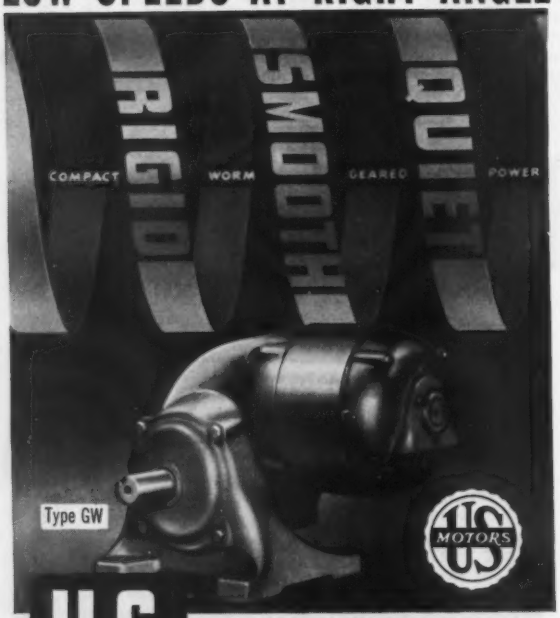
104

Palletized flexibility in parts storage



A new double-faced pallet, specially designed for stackrack assemblies, now permits fork truck handling of parts and materials. Made to fit patented stackracks, into which stackbins, boxes and tote pans slide like drawers, these pallets are designed with adequate clearance for easy fork truck handling. Bottom of each pallet interlocks with top of an assembly so that units can be safely stacked one above another. *Stackbin Corp.*

LOW SPEEDS AT RIGHT ANGLE



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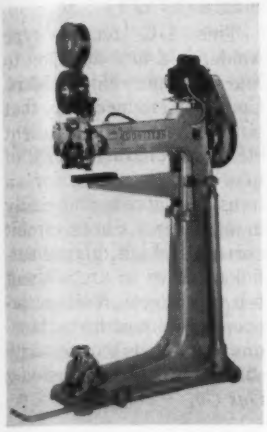
105

Drives two staples at once



A heavy duty duplex-head box stitcher, designed for continuous high speed stapling of corrugated and solid fibre cartons, drives and clinches two staples 2½ in. apart with each stroke. It operates with rated speed of 250 strokes per minute. Containers up to four ft. wide may be fastened with this machine. Wire stitcher is available in three models to suit particular needs of user. *Bostitch.*

106

Missing-mining-link found at last

A new shuttle conveyor which provides "missing link" in continuous mining, fills final gap in mechanized flow of material from mine face to surface and preparation plant. Extendable to 600 or 700 ft. by a rope haul, this conveyor can follow progress of mining while maintaining a fixed discharge or transfer point. It handles up to 250 tons per hour and is manufactured in lengths up to about 500-ft. centers. *Hewitt-Robins Inc.*

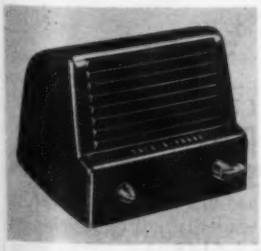
107

Ford assemblies used in fork lift truck

Model 40, two ton capacity fork truck, is designed for efficient use in outdoor storage yards as well as transporting and stacking inside of plants. Pneumatic 7.50 x 15, 10-ply road lug tires on drive wheels and 6.00 x 9, eight-ply rib pneumatics on rear assure ample traction and footing, even on soft ground. For easy, economical maintenance, a number of standard Ford assemblies are used, engine, differential, clutch, hydraulic brakes and axles. *The Knickerbocker Co.,*

108

Intercom sans wired installation



Talk-A-Phone LC-33 is a "wireless" two-station low-priced intercommunication system that requires no wired installations and can be plugged into any electrical outlet. Featuring exclusive "sonic gate," which provides noise-free communication by screening out hum and noise, this unit is designed for locations where instant or temporary installation is desired. More stations can be added at any time. *Talk-A-Phone Co.*

KUX

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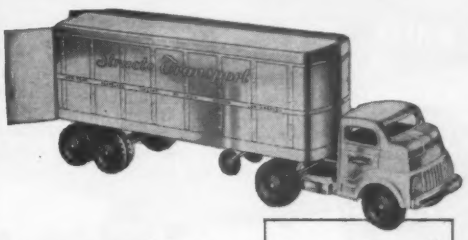
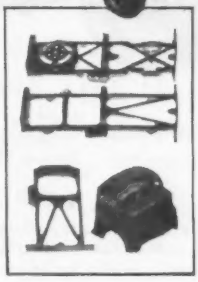


—used by

STRUCTO

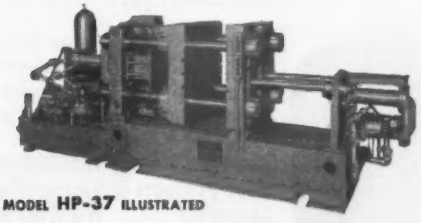
first name in realistic toys



UNGENTLE YOUNG HANDS put famous Structo trucks, trailers and steam-shovels through their "live-action" paces again and again. Toys have to be tough to take that. Structo *is* tough. Employing KUX die casting machines, Structo gets lightweight, structural castings of extra-ruggedness . . . to build toys that last a child-time of pleasure!

Is YOUR PRODUCT conditioned for the treatment it has to take? Quality die castings often make a tremendous difference in costs and saleability. KUX, first name in die casting machines, can make that difference for You!

Write for illustrated catalog showing complete line of KUX Die Casting Machines.



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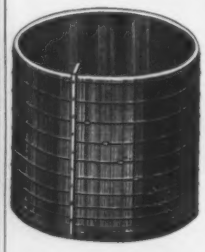

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109

Easy to handle this welder's arc

This DC rectifier-type welder is a new addition to line of Sureweld welders. Company engineers say that both static and transient electrical characteristics of new machine make for an unusually stable and easily handled arc. Short circuit current is high, giving sufficient drive to arc without use of gadgets. Voltage recovery is almost instantaneous when arc is momentarily shorted. *National Cylinder Gas Co.*

110

Photo-copy device duplicates your original

Duplomat ultra is a machine that combines all steps of copying in one compact unit. It is said to produce a black on white copy, just like your original, whether single or double-sided, written, printed or drawn. Printing and developing are performed automatically by means of an electric motor. A built-in timing device eliminates misprints. *The Duplomat Co.*

111

Wrench combines de-burring, non-slip features

To be used with Appleton compression-type couplings, connectors and economy two-piece connectors, this new utility wrench is designed for easier and faster assembly of thin-wall fittings. It combines de-burring and non-slip tightening in one tool. Made of hardened drop forged steel, it is smoothly finished for comfortable gripping and scientifically balanced for proper leverage. *Appleton Electric Co.*

112

Big Joe shows new models

Several new models of Big Joe hydraulic lifts for either manual or battery operation claim numerous functional improvements to increase the ease of handling bulkier loads

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with even greater safety. A few improvements are: a straddle type base that can be furnished in a range of widths up to 50 in.; forks adjustable in any position to widths that provide best load support; swivel casters placed at rear and roller bearing wheels in front, affording maximum maneuverability in minimum space. *Big Joe Manufacturing Co.*

113

Bigger and better stainless steel

A stainless alloy, V2B, combines high hardness, nongalling characteristics and superior corrosion resistance. Material is a hardenable 18-8 type of stainless steel, containing copper, molybdenum, silicon and a small amount of beryllium. It is claimed readily machinable in quench-annealed state, and may be hardened by a low temperature heat treatment which produces no distortion and only a light heat tinting discoloration which may be removed if necessary. *The Cooper Alloy Foundry Co.*

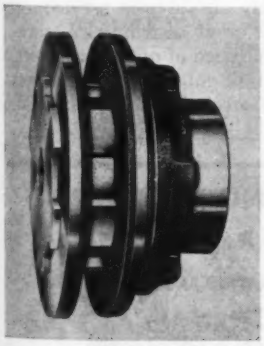
114

For paging personnel

Selective paging of "transient" personnel, such as supervisors and maintenance engineers, can now be readily done by use of IBM's portable paging unit. An integral part of company's electronic paging system, these portable units can be plugged into AC power outlets at locations within a building to receive coded paging signals without special wiring. Both audible and visual signals are received for effective paging regardless of noise level or distance from stationary signals. *International Business Machines Corp.*

115

Good overload protection for machine drives



A new line of adjustable torque-limiting clutches will provide overload protection for machine drives in a wide variety of equipment. These compact slip-type friction clutches act as automatic shear pin mechanisms and avoid time and labor required to insert new shear pins. They are adapted to roller chain drives and are designed to be used in connection with standard Morse type A plain plate roller chain sprockets. *Morse Chain Co.*

116

Fork lift truck wheel-spin stopped

A simple device has been designed to brake a spinning rear wheel so that its mate can free the vehicle from mud, snow or ice. *The Yale & Towne Manufacturing Co.* will install this device at factory on new equipment or will supply it for installation on trucks already in use. The

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FREE 15 DAYS

If for any reason you are not entirely satisfied with it just return the scale to us parcel post prepaid and we will promptly refund your money provided the scale has not been damaged

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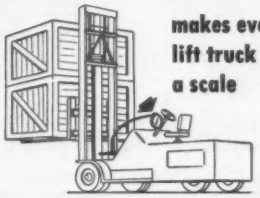

makes every lift truck a scale

Fits Any Hydraulic Cylinder Type Lift Truck

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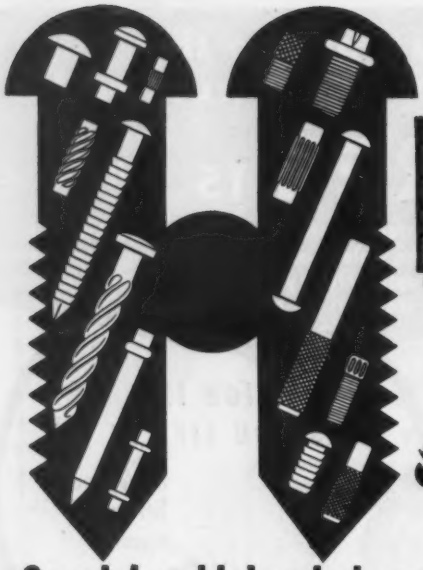

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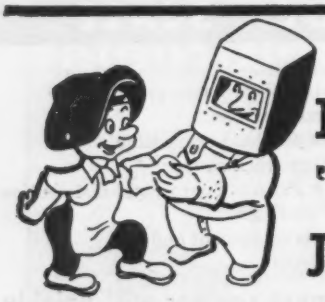

Ind-Air's "Sparky" Joins G.E.

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Mico-No-Stuk operates directly on a braking system of fork truck and is completely independent of differential. It is said to be easily and inexpensively installed.

117

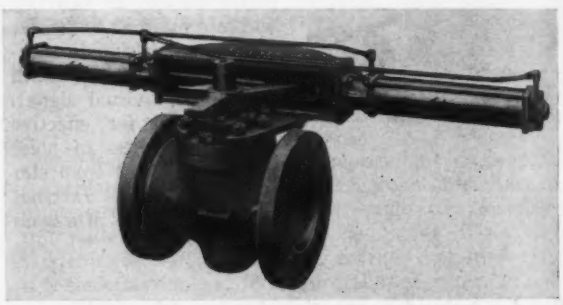
Cordless switchboard for intercom

A fine new thing for intercommunication systems is development of a cordless switchboard to interconnect a telephone system with a mobile two-way radio system, microwave system or power line carrier system. Unit is operated by simply pressing a button to select desired circuit. Simultaneous conversations may be carried on over each of four independent talking channels. *Communications and Electronics division of Motorola, Inc.*

Use rip-out postcard for more information

118

Actuators feature power operation



New line of Ledeen valve actuators are designed as package units for installation directly on valve in service, on valves at manufacturer's plant, or at distributor's warehouse. Mounted on valve without need of outside support, they are for automatic operation of gate, plug, diaphragm and other flow control valves. *Ledeen Manufacturing Co.*

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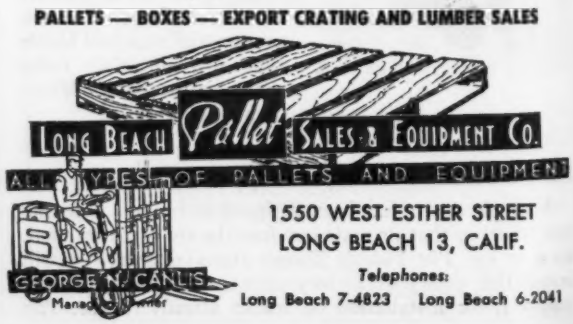

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119

All-magnesium mobile ramp cuts cost of loading

Designed primarily for use in facilitating loading of yard cars, this mobile ramp is claimed to allow full utilization of power trucks in loading operation. As a result, costly hand loading methods can be eliminated, and car-spotting and demurrage expense can be greatly reduced. Ramp is engineered to support loads of 13,000 lbs. It can be moved by one man. Ramp measures 30 ft. long by about 6 ft. wide. *Magline Inc.*

120

Two additions to fork truck family

Two new 6,000-lb. capacity, pneumatic tired fork lift trucks, FTP60-24 and FTPD60-24, available with dual or single drive wheels, have a load capacity of 6,000 lbs. at a 24-in. load center and are available in all standard lift heights of 72, 84, 108, 114 and 120 in. Model FTP60-24 is powered by a heavy-duty Buda 6B-230 gasoline engine. A Buda diesel, model 6BD-230, powers model FTPD 60-24. *The Buda Co.*

121

Reinforced hose handle petroleum products

A new type suction and discharge hose, Quaflex tank truck suction hose, is a special development for handling

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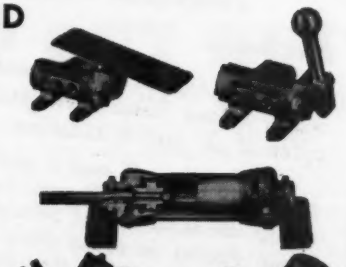

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Penflex manufactures a complete line of four-wall interlocked flexible metallic hose from ½" diameter to 24" diameter. Also seamless welded flexible tubing from 1/32" diameter to 2" diameter . . . automatic barrel fillers, and pneumatic rivet passers.

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FSB. 1102 DPL
Light weight 2-wheel utility truck

FSB. 18
Western Pattern with Steam Bent Handles

FSB. 215
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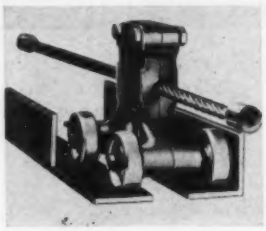
all kinds of petroleum products under either pressure or suction. It is claimed that it is light in weight, will not kink or collapse, maintains full opening in any position, and can be grounded to eliminate static electricity. *Quaker Rubber Corp.*, division of *H. K. Porter Co., Inc.*

122

Table-cable conveyor is versatile on the job



Pallets, shelved trays, fixtures, rotators, etc., can be attached to trolleys of a table height, power driven cable conveyor with 4-wheel carriers fastened to a ⅜-in. steel cable. Although designed as a table height conveyor allowing placement of lights, tools, paint spraying equipment directly overhead, machine can be inclined to higher elevations and floor or ceiling mounted. *The E. W. Buschman Co.*

123

Safety shelter sign for smooth surfaces

A new shelter sign which can be permanently affixed to any smooth surface without use of tools, tacks, water, glue, etc., is of special interest to civilian defense, industrial defense and municipal organizations. It also simplifies air raid shelter directional problems. It is furnished in two

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August, 1953

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parts: one part, 20 by 5 in., carries word SHELTER in four-in. yellow block letters and civil defense insignia in a three-in. yellow circle on a black background; second part has a yellow arrowhead on black background. *Halco Co.*

124

360-deg. rotation for fork truck loads

A compact, hydraulically-operated load revolving mechanism, for use on Elwell-Parker hydraulic fork trucks, permits 360-deg. rotation and is designed for use in conjunction with fork truck attachments. Trucks so equipped are said especially suited for discharging contents from skid bins, positioning loads for storage, and for maximum ease of handling during loading and unloading. *Elwell-Parker Electric Co.*

125

More power with less trouble

Getting power from overhead busway to machines below is now easier and faster with an improved device, FG Flex-A-Plug, designed for use with Trumbull distribution system. Installation is also made easier and faster by new hanger clips which hold plug in position while screws are tightened to anchor it firmly to housing. Flex-A-Plug works on same principle involved in plugging into a wall socket. *Trumbull electric department of General Electric Co.*

126

Automatic alignment for return belts

A new type belt training return idler, Rex Style No. 41, provides automatic alignment for return belt without use of side guide idlers. It consists of a dead-shaft roller-bearing return roll, mounted, at each end, to a toggle-like arrangement of swivel arms suspended from conveyor framework at an angle of about 45 deg. in direction of belt travel. *Chain Belt Co.*

127

Platform lift moves materials from floor to floor

Vertical Lift is a new Rapistan platform lift for moving materials from floor to floor where limited space prohibits use of an inclined belt conveyor. This hoist is said to raise and lower 800-lb. loads at standard 15 ft. per minute speed, or 300 lbs. at 30 ft. per minute. Platform can be lowered to within 6½ in. above floor level, and raised to a top height of 20 ft. Micro limit switches are adjustable to accurately stop platform at any point in top and bottom range of travel. *The Rapids-Standard Co., Inc.*

128

Compact models join lift truck line

Models F-4R and F-6R Erickson power lift trucks, with 4,000-lb. and 6,000-lb. fork lift capacity, are designed for both outdoor and indoor use where a smaller, compact truck is needed. With large pneumatics on all wheels, complete operator vision from seat behind mast, and 12-in. center underclearance, these models are said to have excellent traction on rough or soft ground, and can easily clear high sills, tops of steep ramps, etc. *Erickson Power Lift Trucks, Inc.*

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PICTURED above is group attending dinner meeting held on July 22nd in Los Angeles for the purpose of organizing a Los Angeles Chapter of the American Material Handling Society. This new chapter is the first of its kind in the 11 Western States.

AMERICAN MATERIAL HANDLING SOCIETY'S first Western chapter

LOS ANGELES Chapter of the American Material Handling Society was organized at a dinner meeting held in Los Angeles on July 22.

Attending the organizational meeting were men representing many important Southern California industries, all of whom are interested professionally in advancing the theory and practice of Material Handling and allied arts and sciences through research, discussion and publication.

The organization of this new chapter, the first of its kind in the West, marks a significant milestone in the growing industrial importance of the Los Angeles area, and in the history of the American Material Handling Society, a national organization established in 1949 and now operating with chapters in most eastern and midwestern key industrial centers.

Executive officers and directors elected at this organizational meeting of this new Los Angeles Chapter are:

C. E. Hawksley, Ford Motor Company, chairman; W. E. Kappler, North American Aviation, Inc., vice chairman; J. E. Badgley, *Western Industry*, secretary; J. Alden Lane, Alden Equipment Co., treasurer. Directors are: John R. Huffman, University of Southern California; Joseph M. Druliner, Norris-Thermador Corp.; Harry R. Butler, Richards-Wilcox Mfg. Co.; Wm. F. Mills, Pacific Factory; J. Wade Switzer, Southwest Steel Rolling Mills; H. N. Linton, North American Aviation, Inc.; W. H. Kilkenny, Hyster Co.; R. S. Phoenix, Bendix Aviation Corp.

Technical divisions of the American Material Handling Society, the fastest growing engineering group in existence, cover such phases of industrial activity as bulk handling, unit handling, industrial packaging, warehousing, carrier handling, handling operating analysis, and allied fields.

Chapter membership offers its members the opportunity to participate in a planned program of activities designed to broaden the knowledge of each individual member, and to increase the usefulness of the profession as a whole through monthly meetings covering technical material handling data provided by speakers, panel discussions, plant tours and technical conferences.

Those interested in securing additional information on this new Los Angeles Chapter of A.M.H.S., or membership therein, are invited to contact J. E. Badgley, Secretary, Los Angeles Chapter, American Material Handling Society, 128 So. Mansfield Ave., Los Angeles 36, Calif., or call WEbster 8-8512.

ELECTED Officers and Directors of the newly organized Los Angeles Chapter of the American Material Handling Society are: seated first row from left to right: J. Alden Lane, Alden Equipment Co., treasurer; W. E. Kappler, North American Aviation, Inc., vice chairman; C. E. Hawksley, Ford Motor Company, chairman; and J. E. Badgley, "Western Industry," secretary. Directors standing in rear row from left to right are: Harry R. Butler, Richards-Wilcox Mfg. Co.; Wm. F. Mills, Pacific Factory; J. Wade Switzer, Southwest Steel Rolling Mills; Joseph M. Druliner, Norris-Thermador Corp.; H. N. Linton, North American Aviation, Inc.; W. H. Kilkenny, Hyster Co.; Robert S. Phoenix, Bendix Aviation Corp.; and John R. Huffman, U. S. C.

WESTERNERS AT WORK

Arizona

GLENN P. BAKKEN is elected president of Phoenix *Chamber of Commerce* by chamber's board of directors. He is general plant manager of *Reynolds Metals Co.*, Phoenix. JOHN H. BRAHM is chamber's new first vice president and W. R. MONTGOMERY treasurer.

California

Marchant Calculators, Inc., creates posts of operating vice presidents and appoints HAROLD T. AVERY, formerly chief engineer, to

W. Kassebohm *H. T. Avery*

position of vice president—engineering, and WALTER KASSEBOHM, formerly tool engineer and designer, to position of vice president—manufacturing.

S. T. WILLIAMS, formerly manager of engineering, military division, *Continental Motors Corp.*, is appointed works manager of *Rosan Inc.*, Newport Beach, producer of metal fasteners.

SVANTE TIBERG retires from *Ducommun Metals & Supply Co.*, Los Angeles. In reorganization of company's purchasing activities promotions are as follows: MILES ALEXANDER, manager of industrial supply division; ED LEIS, manager, abrasive and tools division; HOWARD PETEFISH, manager, non-ferrous metals division; JACK SUPANCICH, manager, steel division.

Lockheed Aircraft Service, Inc., and *Lockheed Aircraft Service—International* elect J. J. AROSTEGUI, former assistant treasurer, as treasurer, and MAX H. CRAWFORD, former assistant secretary, as secretary of these two companies.

WILSON E. ARTHUR is named assistant to Vice President CHARLES T. DRANEY of *Bechtel Corp.*, San Francisco.

THOMAS W. BLAZEY becomes office manager of *B. F. Goodrich Co.'s* Los Angeles plant, moving from Akron, Ohio, where he was factory accounting manager. C. B. PUTNAM, formerly office manager at Los Angeles, transfers to firm's textile plant at Martha Mills, Georgia.

R. L. Geiler *R. H. Albisser*

Lammot du Pont Safety Award is presented RAYMOND L. GEILER, president of *A. R. Maas Chemical Co.*, Los Angeles, by General Safety Committee of *Manufacturing Chemists' Association*. Award was given company, a division of *Victor Chemical Works*, for showing greatest improvement in safety among chemical firms with less than 2,000,000 man-hours exposure.

E. P. WOHL, formerly on staff of U. S. Secretary of Defense as director of defense management committee, joins *Consolidated Vultee Aircraft Corp.*, San Diego, as assistant to president. A. W. MORGAN, works man-

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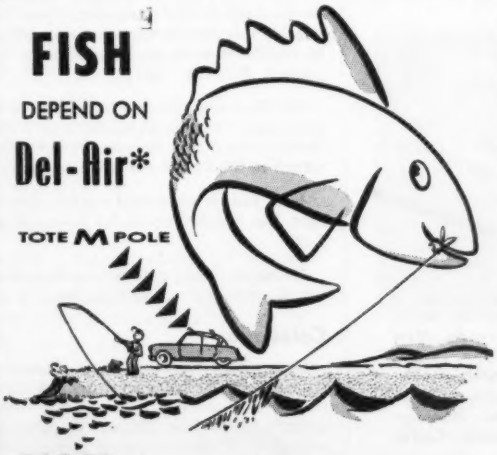

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Pulley shell of this revolutionary head pulley rotates around electric motor and reduction gears, which are held stationary by torque arm attached to conveyor frame. Quickly installed — requires no more room than idler pulley. All moving parts protected against weather, grit, dirt. Diameters 16" to 48". 5 to 75 hp. for voltages to 2300. Job proved.

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Pulley and Sprocket Dept.
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52

ager of Plant 1, is assigned as acting general manufacturing manager, new position set up in *Convair's* San Diego division. W. L. YOUNG, acting works manager, fills his place at Plant 1. P. M. PROPHETT takes post as manager of F-102 flight test operations and is replaced as manager of production flight by W. B. HARWELL, chief pilot. CHARLES F. HORNE, Rear Admiral, USN (Ret.) joins company as manager of Pomona Division, producing guided missiles.

PHILLIP R. HEIM, works manager at *Vard Inc.*, Pasadena, is appointed vice president in charge of manufacturing.

P. R. Heim

D. L. Mason

DONALD L. MASON accepts position of plant engineer with *Superior Electrocast Foundry Co.*, South San Francisco. He leaves Stanford University, where he has been assistant professor of mechanical engineering.

WILLIAM H. BERETISH joins *Packard-Bell Co.*, Los Angeles, as assistant to the president, to take charge of the firm's diversification program. He was formerly special assistant to operating vice president of *Dole Valve Co.*, Chicago.

A. F. LEATHERS becomes manager of *Swift & Co.'s* plant in South San Francisco. Transfrering from plant at Spokane, Washington, he succeeds E. D. FLETCHALL, who is appointed assistant to executive vice president in charge of meat-packing plants at firm's general offices in Chicago.

DR. RALPH L. POWER, in charge of company paper and trade publicity at *Hoffman Radio Corp.*, Los Angeles, resigns post to return to his own public relations office.

J. B. JOBE is appointed construction manager, Los Angeles region, for *Johns-Manville Corp.*

Deceased: NED JENISON, president of *Jenison Machinery Co.*, San Francisco.

Colorado

Great Western Sugar Co., Denver, appoints E. H. HUNGERFORD, general chemist, to post of director of research and chemical control, succeeding HENRY W. DAHLBERG, retired. C. T. CARNEY retires as superintendent of the Greeley mill and is replaced by CLARENCE E. POTTER, former assistant superintendent at Gering, Neb. R. H. MYERS, retired superintendent at Sterling, is replaced by GEORGE W. ATKINSON, former superintendent at Ovid. Atkinson is replaced by S. L. FORCE, former superintendent at Gering, Neb.

JOHN C. MITCHELL is appointed manager of uranium-vanadium mines of *Climax Uranium Co.*, Grand Junction, and resigns from *American Smelting and Refining Co.* His former position as superintendent of Leadville district mining operations is filled by A. E. HAESLER, formerly general superintendent of the *Mike Horse Mining and Milling Co.*, Mike Horse, Mont.

Montana

COLIN W. RAFF is promoted to post of executive assistant to officers of *Montana Power Co.*, Butte, and also heads publicity and advertising activities.

Oregon

JAMES G. WILSON is named traffic manager of *M and M Wood Working Co.*, Portland, in promotion from post of assistant.

GEORGE D. WARD joins staff of *West Coast Lumbermen's Association* as assistant to technical services director. He replaces ROBERT E. EBY, now with *Weyerhaeuser Sales Co.*, Tacoma, Wash.

GARY D. HANCOCK and GEORGE MILLER are appointed vice presidents of *North Pacific Lumber Co.*, Portland.

AL STINCHFIELD is named general manager of *Menasha Plywood Corp.'s* Western division, North Bend, succeeding CHARLES M. DUECY, who becomes president of *Menasha Sales Corp.*, Chicago.

WAYNE H. SAFLEY becomes general manager of *Pope & Talbot* lumbering operations near Oakridge.

Utah

C. R. NAYLOR is appointed superintendent of *Garfield Water Co.* and *Garfield Improvement Co.*, affiliates of *Kennecott Copper Corp.*, succeeding H. CLAUDE ANDERSON, retired. ROYAL P. ANDERSON is named assistant superintendent. Naylor's former position as assistant director of public relations, Utah Copper Division of Kennecott, Salt Lake City, is filled through promotion of RICHARD L. STEWART, former secretary to general manager.

JAMES C. O. HARRIS, formerly with *Columbia-Geneva Steel Division, U. S. Steel Corp.*, Salt Lake City, joins Bureau of Mines staff, Washington, D. C., as commodity industry analyst.

Salt Lake City *Chamber of Commerce* elects as president SID H. ELIASON, president of *Western Gypsum Co.*, and as vice president W. T. NIGHTINGALE, president of *Mountain Fuel Supply Co.*

Washington

KALMAN L. PELL is appointed design engineer on staff of Division of Industrial Research, *Washington State College*. GEORGE D. WAGNER joins Division's staff as spectroscopist.

CURTIS G. CORTELYOU is named manager of *General Petroleum Corp.'s* Ferndale re-

V. M. Stanich *C. G. Cortelyou*

finery, succeeding R. E. LAUTERBACH. V. M. STANICH becomes chief engineer.

WALTER DELONG retires from position as vice president of *St. Regis Paper Co.* and

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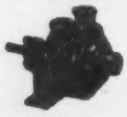

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manager of company's Tacoma operations. He is succeeded by J. M. LAMB.

ADOLPH D. SCHMIDT, JR., formerly vice president and general chairman, is elected president of *Olympia Brewing Co.*, Olympia. TRUEMAN L. SCHMIDT, construction engineer, is named vice president.

Washington Water Power Co., Spokane, appoints CLARENCE E. CANNON chief electrical engineer and EARL VAUGHN chief transmission and distribution engineer. Other new appointments in its engineering department are: THOMAS H. JUDD, formerly superintendent of transportation and water systems, is placed in charge of all civil and water system engineering. His assistant is RALPH STEWART, civil engineer. WILLIAM A. HILL heads hydraulic, structural and mechanical engineering section. JOHN STOBIE and EARL JOHNSON are his assistants. GLEN GEORGE is named construction engineer to supervise building of transmission and distribution lines under contract. New chief draftsman is DONALD A. COLVILLE. E. H. COLLINS joins engineering department as general engineering consultant.

SYDNEY M. ROSENBERG, formerly director of *New England Fish Co.* and head of subsidiary, is appointed to presidency. He replaces HARALD SYNNESTVEDT, retired.

Wyoming

EVERETT E. LINGLE, formerly assistant superintendent of *Great Western Sugar Co.* mill at Billings, Mont., is appointed superintendent of Lovell mill. He succeeds FRANCIS WOOD, now superintendent at Gering, Neb., mill.

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ASSOCIATIONS ELECT

California Redwood Association, tree farm committee: Chairman, C. RUSSELL JOHNSON, executive vice president of *Union Lumber Co.*, Fort Bragg, Calif.

Utah Society of Profesional Engineers: President, J. VERNON SHARP; first vice president, WAYNE D. TURPIN; second vice president, ROBERT W. AYER; third vice president, R. S. TRINNAMAN; fourth vice president, VINCENT E. CLAYTON; secretary, JOHN S. DUDER.

Forest Products Research Society: President, LESTER J. CARR, *L. J. Carr & Co.*, Sacramento.

Pacific Spring Manufacturers Association: President, GUSTAV SCHWARZ, *Connor Spring Manufacturing Co.*; vice president, O. D. PERKINS, *Holister Coil Spring Manufacturing Co.*; secretary-treasurer, WILLIAM GLYNN, *Griffin Coil Spring Co.*

Mining Association of Montana, Helena chapter ("Last Chance Gulch Mining Association"): President, JOHN F. HOPKINS; vice president of membership, DONALD W. JOHNSON; vice president of program, IVOR POUNDS; vice president of publicity, CHARLES R. BRAZIER; secretary-treasurer, HUGH K. GAW.

Lead Industries Association: President, J. B. HAFFNER, vice president and general manager of the *Bunker Hill and Sullivan M. & C. Co.*, Kellogg, Idaho.

American Foundrymen's Society, Southern California chapter: President, HUBERT CHAPPIE, *National Supply Co.*; vice president, CHARLES R. GREGG, *Gregg Iron Foundry*; secretary, WILLIAM BAUD, *Mechanical Foundries Division*; treasurer, WILLIAM MITCHELL, *Utility Steel Foundry*.

American Foundrymen's Society, Northern California chapter: Chairman, W. S. GIBBONS, *Ridge Foundry Co.*; program chairman, JOHN BERMINGHAM, *E. F. Houghton & Co.*; assistant program chairman, CLAYTON RUSSELL, *Phoenix Iron Works*; secretary, DAVIS TAYLOR, *American Wheelabrator Co.*; treasurer, FRED MAINZER, *Pacific Brass Foundry Co.*

American Mining Congress: Nevada chairman, NORMAN E. HANSON, *Basic Refractories*, Gabbs, Nev.

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Western TRADE WINDS

News about those who distribute and sell industrial equipment and materials

Yale trucks

Materials Handling Engineers, Salt Lake City, is picked as sales representative in Utah and portions of Wyoming and Nevada for Yale industrial trucks, product of Yale & Towne Manufacturing Co., Philadelphia. Clinton P. Mott and Ralph B. Rees are principals of Materials Handling Engineers.

Dillon Stevens appointed

From left: D. Stevens, A. Morton, and J. A. Arnett of Dillon Stevens Co.

Dillon Stevens & Co., Los Angeles, is newly appointed sales representative in states of California, Arizona, and Nevada for Morton Machine Works' line of fixture clamps and fixture details. Picture was taken at an open house in honor of this appointment.

Distributor for Lift Trucks, Inc.

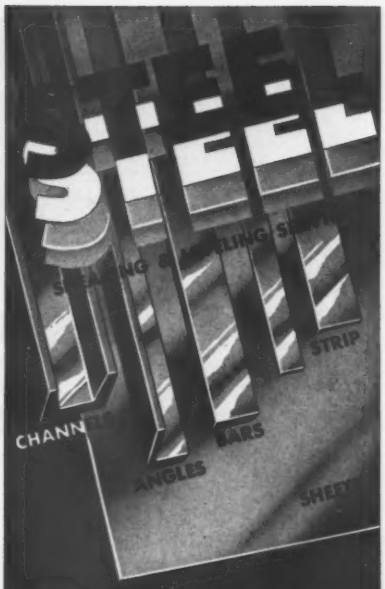
McKinley Equipment Co., Los Angeles, is appointed exclusive Southern California distributor for Lift Trucks, Inc., Cincinnati, Ohio. Line includes hand, hydraulic and motorized lift trucks, pallet stacking trucks and in-plant small tractors.

Helicoid Gages on Pacific Coast

Pacific Scientific Co. is appointed Pacific Coast representative for sales and service of Helicoid gages, manufactured by Helicoid Division of American Chain & Cable Co., Bridgeport, Conn. Pacific has offices in Los Angeles, San Francisco, Seattle and Portland. Other American Chain & Cable products sold by Pacific are Rockwell and Tukon hardness testers.

Drake Steel promotions

William H. Oakford is promoted to branch manager of Drake Steel Supply Co., San Diego. He has been assistant manager of company's Fresno division. Arl J. McCormick, formerly operations supervisor at San



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Diego, becomes assistant sales manager in field sales division at Los Angeles. Bill F. Mowbray is promoted from post of assistant credit manager at Fresno to that of credit manager at Los Angeles.

Joins Anaconda Wire and Cable

Ray Galenbeck joins Anaconda Wire and Cable Co. as salesman in Seattle office. His previous sales background includes service with G. E. Supply Co. in Des Moines, Iowa, and, earlier, with Bonne Electric Construction Co., Amarillo, Tex.

New Allis-Chalmers representative

Robert C. Nealey, sales representative for past several years in Spokane district office of Allis-Chalmers Manufacturing Co., moves into post of company's new resident representative at Butte, Mont., with offices in Hirbour Bldg.

Cost Reduction adds new lines

Cost Reduction Equipment Co., Los Angeles, is appointed exclusive Southern California sales representative by Silent Hoist & Crane Co., New York, manufacturers of "Krane Kar" mobile swing boom crane, "Lift-O-Krane" and "Liftruck" heavy duty fork lift trucks; and by H. C. Sweet Co., Detroit, manufacturers of "Florline" equipment for marking of safety and parking lines.

New Portland manager for White

D. Collins

J. C. Knapp

Dave Collins becomes manager of The White Motor Co.'s Portland branch, replacing J. C. Knapp, who moves to regional headquarters in San Francisco as assistant to regional manager. Collins served as district manager for Pontiac before joining White sales organization in 1949. Knapp has been with White since 1922, serving for past four years as Portland branch manager.

New Keller subsidiary

Keller Tool Co., Grand Haven, Mich., manufacturer of air tools, establishes a sales subsidiary company in Los Angeles, known as Keller Tool-California, Inc. New company is sales and service outlet for Keller tools in Washington, Oregon, California and Arizona. W. A. Nilsson, formerly branch manager of Keller's Los Angeles sales office, is general manager of new corporation.

Close West Coast office

Until fall, Miniature Precision Bearings, Inc., will provide sales and engineering service from its Keene, N. H., plant. A new MPB West Coast branch plant will be opened early in fall.

First Alaska distributor

General Electric Co. appoints Northern Commercial Co. as its first agent and distributor of electrical equipment in Alaska. Northern's offices in Juneau, Ketchikan,

Anchorage, Fairbanks and Nome will stock small equipment and renewal parts, backed up by stocks of larger apparatus in Seattle. It is Northern's first venture into major electrical equipment field.

Clark Equipment adds Ross truck line

Clark Equipment Co., manufacturer of materials handling industrial trucks, expands its dealer organization on West Coast to handle new line of Ross straddle trucks and fork-truck lines. Clark acquired The Ross Carrier Co. in May of this year. Robert H. Dodd Equipment Co., Portland, Ore., is appointed as new Clark dealer, and present dealers who will sell and service Ross trucks are Glen L. Codman Co., Inc., San Francisco; Robert H. Braun Co., Los Angeles; and Preston Faller, Seattle, Wash.

New Alsynite sales office

Donald Colburn joins Alsynite Co. of America, San Diego, as first district sales manager in Southern California and Arizona. He was formerly with Owens-Corning Fiberglas Corp. as sales executive. New office of Alsynite is Guaranty Building, 6331 Hollywood Blvd., Hollywood.

Insul-Mastic licensee

Plant Asbestos Co., Emeryville, Calif., accepts licensee contract with Insul-Mastic Corp. of America, Pittsburgh, Pa. Firm will distribute and apply Insul-Mastic coatings for vaporsealing insulation, waterproofing masonry and preventing corrosion.

New men for Minneapolis-Honeywell

Minneapolis-Honeywell Regulator Co., Industrial division, adds 22 new sales engineers throughout U. S. and Canada—among them Billy F. Schaible, Denver; Brian F. Trankle and Harold E. Musgrove, Los Angeles; and Ellery L. Hall, Seattle.

Becomes district manager

William J. Borwick is appointed district manager of U. S. Steel Supply Division, Portland, Ore. He transfers from Los Angeles office, where he has been assistant district manager. George R. Coffin, former Portland district manager, has resigned.

W. J. Borwick of U. S. Steel

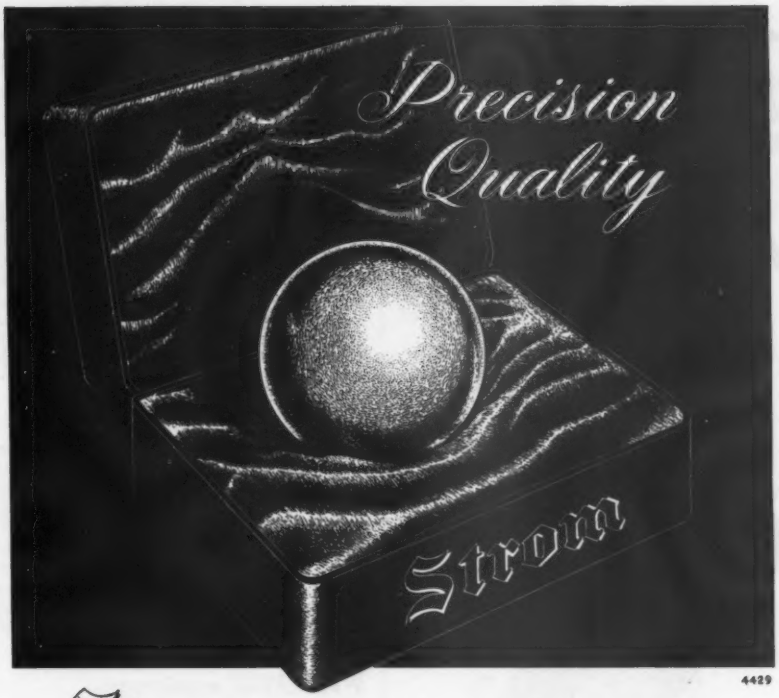
P. S. Hill of Hyster Co.

Hyster sales chief

Philip S. Hill is elected vice president in charge of all sales for Hyster Co., Portland, Ore., manufacturer of materials handling equipment and tractor and logging tools. He has been with company for over 20 yrs. and advances from post of general sales manager.

Knapp Co. sales reorganization

James H. Knapp Co., Inc., Los Angeles, reorganizes its sales engineering department under direction of R. Paul Toeppen, vice president. Knapp furnaces, melters, forges,



4429

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Pacific Coast Representative:
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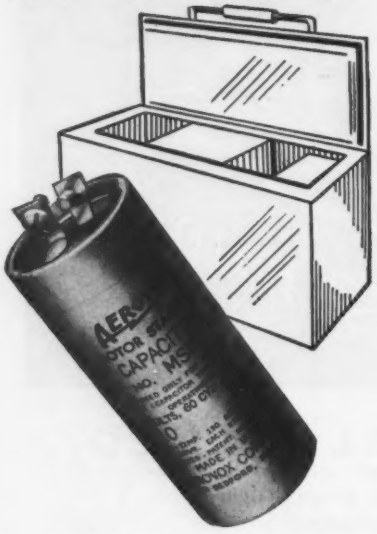
Fastest

MOTOR-CAPACITOR REPLACEMENTS



✓ Refer to the Aerovox motor-capacitor listings for the right *exact-duplicate* or *universal* replacement. Don't take chances!

✓ If there's no nameplate or other identification to go by, then use the Aerovox *Capacitor Selector* for proper selection of capacitance value.

✓ To get motor running *immediately*, use the Aerovox *Emergency Capacitor* which provides any required capacitance.

✓ Get the proper Aerovox motor capacitor from your supplier.

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ovens and other products will be sold by Jack Brass, Abe Frumkin, Charles Wirth and Henry Posner. Knapp-Russ induction melting furnaces will be sold and serviced under direction of Lenn Stuhlmiller, formerly chief service engineer. Knapp-Lee "Quick Quench" aluminum heat-treating furnace sales will be headed by J. Stanley Macaulay.

Bentley goes to Parker

Don Bentley joins Parker Boiler Sales Corp., Los Angeles, as industrial sales engineer. He has been with Payne Furnace Co. as West Coast regional sales supervisor for six and one-half years, Southern California Gas Co. for five and one-half years as field engineer, and during past seven years with General Controls as Los Angeles branch manager.

Roylyn fills sales posts

H. H. Witte and George A. Strever are named to newly-created sales posts of Roylyn, Inc., Glendale, Calif., in company's expansion of service to industry. Witte, who joined firm in 1952, becomes district sales manager in Northern California, with headquarters in San Francisco. Strever, who has been with Roylyn since 1946, is appointed Western division sales manager, including inter-mountain states. He will work out of general offices at Glendale.

Westinghouse appointments

William C. Swinghamer is named manager of district application data and training department, Westinghouse Electric Corp., San Francisco. He has held post of application data and training representative in Westinghouse offices at Pittsburgh, Pa., and St. Louis. Harold S. Schuler, in charge of company's Pacific Coast District sales promotion since 1939, transfers to Pittsburgh, Pa., as assistant manager of general advertising.

HECO PALLETS CAN SAVE YOU THOUSANDS OF DOLLARS!

If weight compression damage is a prime factor in your warehouse storage problems, use HECO partitioned pallets. For example, in Standard Oil Company of California's San Francisco warehouse, they use HECO for battery and tire storage. As a result, Standard is able to transport more merchandise than ever before, stack it higher to take advantage of overhead space, and do away with weight compression damage. Like Standard Oil and many others, it may pay you to investigate HECO.

PAT. PENDING

HAMERSLAG EQUIPMENT CO.
45 Elmira Street
San Francisco 24, Calif.

From salesman to branch manager

Wayne Hill, since 1948 a salesman in Los Angeles area for Trailmobile, Inc., is appointed manager of company's factory branch in that city. He has been a member of Trailblazer Club of top Trailmobile salesmen for past two years. Trailmobile is a subsidiary of Pullman Incorporated.

usAIRco representative

Norman S. Wright & Co., San Francisco, Portland and Seattle, adds complete line of ventilating and air conditioning equipment manufactured by United States Air Conditioning Corp., Minneapolis. J. D. Kniveton is manager of San Francisco office; W. L. Johnson, Seattle; and W. H. Oscanyan, Portland.

Bone appoints sales manager

In line with its expansion program in electroformed metal ducting, aircraft parts and centrifugal investment casting, Bone Engineering Corp., Glendale, Calif., appoints Edward G. Maclennan as its sales manager. He was formerly associated with Standard-Thompson Corp. of Dayton, Ohio, and with Clifford Manufacturing Co., Boston, Mass., as factory representative in 11 Western states.

Field sales rep. for Miller Electric

William J. Spillman is named field sales representative for Western California and Arizona by Miller Electric Manufacturing Co., Appleton, Wisconsin, maker of electrical welding equipment. He comes from Arizona Welding Equipment Co., Tucson, where he was in that company's sales department.

Sales engineer for Kwikset

Kwikset's powdered metal products division adds a sales engineer, John Meyer, to cover Los Angeles and Northern California area. After his discharge from U. S. Air Force, Meyer joined F. J. Stokes Machine Co., Philadelphia, Pa., manufacturer of powdered metal presses, as West Coast sales engineer. In 1951 he established his own industrial tabletting concern which he sold to join Kwikset organization in late 1952.

MILLER-ROBINSON CO.

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CLASSIFIED SECTION

Space is sold as advertisers' inches. All advertisements in this section are ½ inch short of contracted space to allow for borders and composition. Rates are $7.50 a column inch. Copy should be sent in by the 25th of preceding month if proofs are required; by the 28th if no proofs are required.

FOR SALE
— Four —
1951 International West Coasters
$11,500.00 Terms

Model LFD 402 227" WB chassis and cabs. Buda 215 HP, 6DA, 844 diesel engines. 8051 Main and 8031 G Auxiliary transmissions. SFD 460 Timken double reduction differentials. 1000-20 12-ply tires on Budd wheels. Radiator guards, lubrifiners, oil bath air cleaners, four wheel trailer connections and hand valves. Completely reconditioned and painted.

See or call
JUCKELAND TRUCK SALES AND SERVICE, INC.
11th and Klamath Phone 2-2851
KLAMATH FALLS, OREGON

Call King YU-3-3176
MATERIAL HANDLING EQUIPMENT
Lift Trucks • Hand Trucks • Conveyors
Hoists & Cranes
Casters & Wheels
IRVING G. KING & CO. ★ SINCE 1930
821 MATEO ST. L. A. 21

PLATE ROLLS
Complete with 2 top rolls, 16" in. diam. and 10½" diam. Can roll ¾" plate, 16' long to 24" diam. 50-hp. motor included. Mr. Hall
PACIFIC COAST ENGINEERING CO.
LA 2-6100 Alameda, Calif.

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PHOTOCOPIES
in 1 MINUTE at your desk—on the
DUPLOMAT-ULTRA
low priced—all electric, fully automatic Photocopying Machine. Exposing, developing and transferring in ONE UNIT. Photolike duplicates up to 14½" width, any length.
THE DUPLOMAT COMPANY
126 Post Street YU 6-5941 San Francisco, Calif.

ANODIZING FACILITIES
Full finishing service for aluminum products. Clear Anodize; R-5 Bright Dip; Color Anodizing; Government Specifications; Frankford Arsenal Spec. No. FXS-963 Type B Class 1, 2, & 3.
ALSO DICHOMATE SEALING:
Prompt Service from
W. F. HEINE SUPPLY CO.
6015 Adeline St. Oakland 8, Calif.
OLympic 3-5500

Pipe Repair CLAMPS
Made for every type of leak—any temperature or pressure. Send for Catalog No. 41-O.
M. B. SKINNER CO., SOUTH BEND 21, INDIANA

100 GENUINE 8 x 10 PHOTOS **10¢** ea
24 HOUR SERVICE!
FREE DELIVERY ANYWHERE
MADE DIRECT FROM PHOTOS OR NEGATIVES • 50 8 x 10 13c ea • 500 8 x 10 8c ea
1000 8 x 10 GLOSSIES **7¢** EACH
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5000 $21 PER M **2½¢** EACH
SAVE THROUGH QUANTITY PRODUCTION
FOR COMPLETE PRICE INFORMATION WRITE OR PHONE
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5509 SUNSET BLVD. HOLLYWOOD 28 CALIF.
LARGEST PHOTO REPRODUCTION PLANT IN WEST

"We have had NUMEROUS REPLIES to our ad. Thank you very kindly."

So writes one satisfied user of *Western Industry* classified ads (name on request).

YOU TOO can benefit by the high readership, fast response offered here.

See rates at top of page.

SEND IN YOUR COPY TODAY!

TIME-SAVING packaging

PACKAGING of subsistence for overseas shipment has been facilitated by the suggestion of two Ogden, Utah, men employed at Utah General Depot.

Vern Bowcutt and LaGrande Noorda have received awards totaling $145 each as a result of Army-wide savings on packaging.

Their device consists of an attachment for a roller conveyor. The problem is keeping the carton flaps in place while the sleeve is slipped on for overpacking.

Overpacking means the placing of the fiberboard carton of supplies, packed for domestic consumption by the manufacturer, into a second box made of V-board. Then the whole package is cased in a fiberboard sleeve which reinforces it.

¼ PRICE
Detrex Degreasers, tanks good
Briggs Clarifiers, unused
Eng. test stds., 5' x 6' cast iron
½ PRICE
Hercules Power Units, top condit.
Saw Mill Carriage, #3 Amer.
Comet, 38" rad. timber cutter, unus.
HEWITT
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INDUSTRIAL PROPERTY

FOR SALE
8 acres of industrial, farming land. Trackage available. Abundant water; home and cottage. In heart of Salt Lake County.
Contact owner—
FOREST NOORDA
175 West Central Avenue MURRAY, UTAH

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Practical, Down-to-Earth Welding Rods
Alloys as they are supposed to be

Corrosion Resistant—
Clean metal

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Low in cracking

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THE West ON ITS WAY

NEW PLANTS, EXPANSIONS, NEW INDUSTRIES, PRODUCTION CONTRACTS, DEVELOPMENT PROJECTS, UTILIZATION OF RESOURCES

1¼ MILLION NEW HOMES NEEDED

NEARLY a million and a quarter new urban dwellings will be required in the 1950-1960 decade in the eleven Western States to take care of the expected population increase.

This estimate is from the "Decade of Opportunity" chart series developed by the Western Division office of the National Association of Manufacturers. The accompanying table shows the figures in detail. NAM's estimate on labor force and general capital requirements were reported on this page last month.

* * *

The quarterly Western business forecast of the Western home office of the Prudential Insurance Company reports that three out of every five business and professional leaders in the West, in a panel of 200, expected that their own businesses would improve in the third quarter of 1953, but were evenly divided as to whether business activity in the West would go up or down from recent high levels. Service industries, trade, manufacturing and agriculture-extractive were optimistic, while the majority in finance, construction-real estate and business-professional groups expected a third quarter decline.

* * *

Despite the tremendous new capacity in steel developed in the last decade, the steel deficiency in the seven Western states has actually increased since 1940, according to Jack L. Ashby, vice president and general manager of Kaiser Steel Corporation. He reports that the area consumed 2,500,000 tons of steel products in 1940 and produced 700,000 tons, while in 1952 it consumed 5,500,000 tons of products and produced 3,300,000 tons. Thus the deficiency increased from 1,800,000 tons to 2,200,000.

New people . . . require new homes . . . and big capital outlay

New urban homes for projected population increase

State	Col. I Estimated Population Increase, by State, 1950-1960	Col. II No. of Privately-owned New Urban 1-family struc. needed to accom. pop. growth, 1950-1960	Col. III Capital Investment required to meet needs estimated in Col. II
Arizona	286,413	37,000	$ 344,100,000
California	4,332,777	893,000	8,304,900,000
Colorado	290,911	47,000	437,100,000
Idaho	128,363	16,000	148,800,000
Montana	86,976	11,000	102,300,000
Nevada	54,977	9,000	83,700,000
New Mexico	195,813	26,000	241,800,000
Oregon	519,659	74,000	688,200,000
Utah	187,138	30,000	279,000,000
Washington	641,037	115,000	1,069,500,000
Wyoming	52,471	7,000	65,100,000
TOTAL: (11 Western States)	6,776,475	1,265,000	$11,764,500,000

NOTE: COLUMN I—based on projections, U. S. Bureau of Census.

COLUMN II—Col. I multiplied by percentage of state population which is termed "urban" and this total divided by the number of persons per urban household by state, and further reduced by applying the 1950-1951 proportion of new privately-owned one-family structures authorized as against the total of private and public new urban dwelling units authorized.

COLUMN III—derived by multiplying Col. II by $9,300 which is the average national construction cost for new privately-owned, one-family dwellings, 1951, as reported by the BLS ("Const. Annual Review" 1951, dated Feb. 16, 1953). (This figure, $9,300, should NOT be interpreted as representing the construction cost of a typical house.)

This chart DOES NOT TAKE INTO CONSIDERATION REPLACEMENTS in housing, only housing needs created by projected population increase, 1950-1960. It assumes that persons per urban household will remain the same (trend is downward), that the relation of urban to total state population will remain the same and that ratio of private to public urban dwellings construction will remain as it was in 1950 and 1951.

A section of the August 1953 issue of **WESTERN INDUSTRY**—609 Mission Street, San Francisco 5, Calif.

ARIZONA

ORE EXPLORATION — New Jersey Zinc Co. enters contract with Verde Exploration, Ltd., covering exploratory drilling in Jerome copper mining district. New Jersey will advance $10,000 for options and leases, and support Verde's operating expenses up to $16,000 per year. Commitment for 1953 is $50,000, after which New Jersey may, at its discretion, withdraw from contract. To develop any commercial discovery, new company will be formed by New Jersey and Verde, with New Jersey holding majority interest and supplying capital up to $1,000,000. Verde was formed in 1947 and holds former properties of United Verde Extension Mining Co.

AREA QUADRUPLED—Concrete Conduit Co. moves from 10-acre to 40-acre site in Phoenix, with modern office building, enlarged plant faciilties, shop and storeroom building and storage area for finished pipe. Capacity is 3,000 ft. of pipe daily, employing over 150 persons. Company manufactures concrete and steel-reinforced pipe up to 72-in. in diameter.

ATOM-AGE BUILDING—Builders Supply Corp., Phoenix, plans demonstration of radiation-resistant building materials about September 1. Developed in company's laboratories under direction of physicist Dr. George G. Olson, new materials, in block or brick or poured concrete form, incorporate mineral ingredients from mine slag dumps and tailings or from low-grade natural deposits. New building materials will be heavier than regular concrete and are designed for above-ground construction, at a cost competitive with ordinary materials.

DMPA CONTRACT — Defense Materials Procurement Agency signs contract with Copper Creek Consolidated Mining Co., Tucson, for purchase of up to 5,500,000 lb. of copper to be produced from Old Reliable mine in Pinal County. Price is set at 29c lb. Mineral extraction will be through leaching ore underground with water and sulphuric acid.

CALIFORNIA

FIBREBOARD EXPANSIONS — Fibreboard Products Inc. furthers expansion and development program with following projects: construction of additional building at its South Gate (Los Angeles) plant for manufacture of corrugated shipping cassea; installation of Miehli 5-color paperboard rotary press at its Stockton plant; building of new waste-paper collection depot and processing plant for its wholly-owned subsidiary, Independent Paper Stock Co., Los Angeles. This plant will have a process building of steel frame construction, 39,500 sq. ft. in area, and two other buildings, each 2,000 sq. ft., for shops and offices.

NEW HOME FOR CRANE—Crane Hoist Engineering Corp., Los Angeles, begins operations in new offices and plant in Bell, Calif. New facilities occupy 66,000 sq. ft., 56,000 of which is manufacturing area. They are part of company's expansion program for production of overhead cranes and hoists.

FORD AWARDS CONTRACT — General contract for construction of Ford assembly plant at Milpitas, near San Jose, goes to J. H. Pomeroy & Co., Inc., San Francisco. Construction of the 1,500,000 sq. ft. plant and auxiliary buildings will get under way soon. Plant completion is scheduled for July 1954.

CHEMPLATE PLANT OPENS—Chemplate Co. establishes general offices and production facilities in a 4,000 sq. ft. plant at 2671 E. 26th St., Los Angeles. Company-developed metal finishing process will be used for plating either new or used customer parts to provide corrosion and abrasion resistance.

BUILD WESTERN PLANT — Alloy Rods Co., York, Pa., begins construction of Pacific Coast division plant in El Segundo. Plant, to be in full operation by October 1, will produce complete line of alloy arc welding electrodes, under supervision of George M. Hohmann, who will transfer from York plant.

DOUGLAS BUILDS—Douglas Aircraft Co., Inc., El Segundo, Calif., Division, starts construction of $2,000,000 building for aircraft design and development, to include two engineering rooms, each an acre in size, and electronic computing machine powered by 300 hp. generator. Architectural firm is Kistner, Wright and Wright, Los Angeles; building contractor is Davis, Kuester and Brown. Building will be completed in February 1954.

RECORD BREAKER — Westinghouse Electric, Sunyvale, starts work on 66,000-kw. steam turbine ordered by Utah Power & Light Co. for its new $10,000,000 steam-electric generating station to be built on Carbon-Utah County line in central Utah. Turbine, 66 ft. long and 207-tons in weight, is largest ever built in West for use in West. It will be shipped, next summer, to Utah generating plant, which is expected to begin operations in December 1954. Condenser for plant is also being built at Sunnyvale; generator will come from Westinghouse plant in East Pittsburgh, Pa.

BUILD OIL TERMINAL—Union Oil Co. of Calif. begins one-year construction project of $5,000,000 marine oil terminal at Rodeo, Contra Costa County, to serve its refinery at Oleum. Planned concrete and steel wharf will accommodate two tankers on offshore side and five barges on inside. Thirty-one separate pipe lines will handle crude oil and refined products, as well as water and utilities. Capacity of terminal is anticipated to be nearly 500,000 bbl. of oil in 24-hr. Union Oil also plans $40,000,000 refinery expansion, to increase percentage of light oil products. Construction will start next year.

ANOTHER PIT RIVER PLANT — Pacific Gas and Electric Co., San Francisco, applies to Federal Power Commission for license to build Pit 7, diversion dam and hydroelectric plant on Pit River, at estimated cost of $16,250,000. Location is about 45 mi. from Redding at upstream end of Shasta Reservoir. Completion of three-year construction is desired in time for operation two years after completion of Pit 6, which is subject of application already filed with FPC. PG&E has three plants now in service in Pit River Basin and is building Pit 4 powerhouse and 4-mi. diversion tunnel, at a cost of $25,000,000, to be completed in 1955.

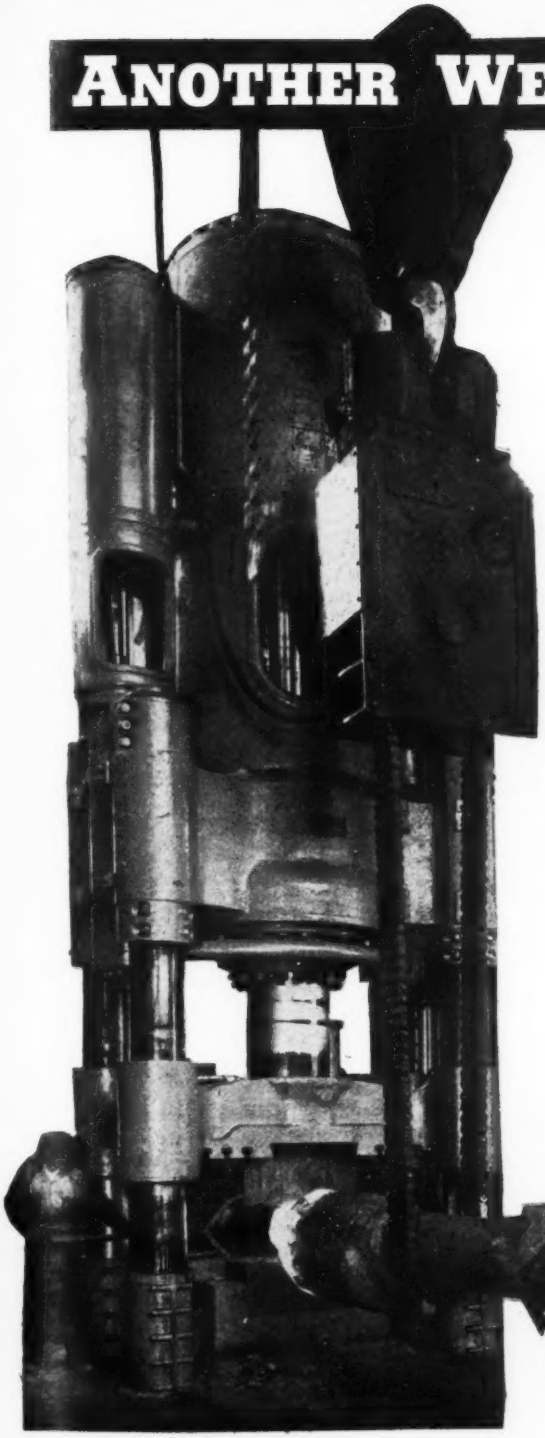
WILL MOVE TO ANAHEIM—Gelvatex Coatings Corp., now occupying leased plant in Pasadena, will move to Anaheim by January 1, 1954, expected date for completion of its $500,000 factory now under construction. Fluor Corp. is builder. Gelvatex manufactures vinyl acetate paint products, and move will increase output at least six times.

NAME CHANGE AND MERGER — Coast Paint and Chemical Co., Los Angeles, changes corporate name to Coast Pro-Seal and Mfg. Co. In merger, it acquires as company divisions Aircraft Metal Forming Co., Inc., and Aero-Cal Engineers Inc., both of Burbank, which will continue with present management and personnel.

HAMM BUYS RAINIER — Theodore Hamm Brewing Co., St. Paul, Minn., buys assets of Rainier Brewing Co., San Francisco, for $1,809,937. Plant will

CERTIFIED EXPANSION—Certified Chrome Furniture Co., El Segundo, moves to $1,750,000 plant with 90,000 sq. ft. covered area, permitting production of 500 to 600 dinette sets daily. New equipment includes overhead conveyor systems and Aetna tube mill, for fabrication of metal tubing within the plant.

ANOTHER WESTERN GIANT



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undergo modernization program and reopen next spring to produce Hamm's beer, operated by newly organized Theodore Hamm Brewing Co. of Calif. Brand name "Rainier" was recently sold to Sicks' Brewing Enterprises, Inc., of Seattle for $362,000.

NEW HIGH OCTANE PROCESS—General Petroleum Corp. starts construction, at Torrance refinery, of new type of processing unit, known as "Thermofor catalytic reformer," for upgrading low-quality gasoline. Unit will cost about $9,000,000. Contractor is Bechtel Corp. Upon completion, scheduled for July 1954, unit will produce about 15,000 bbl., each 42 gal., daily. TCR process, developed by Socony-Vacuum Oil Co., Inc., with which General Petroleum is affiliated, will be made available to oil industry through licensing.

RESDEL ENGINEERING GROWS—Resdel Engineering Corp., Los Angeles, together with subsidiary company, Guided Missiles, Inc., builds additional plant in Glendale. New 21,000 sq. ft. building is needed to accommodate industrial business, largely high frequency heating for plastics, furniture and aircraft fields.

MARINE ENGINE ORDER—Bureau of Ships, Department of Navy, awards $1,250,000 order for marine engines to Hall-Scott Motor division of ACF-Brill Motors Co., to be built in Berkeley plant. Engines will be water-cooled, V-12 type.

BUY 30-ACRE SITE—Robertshaw-Fulton Controls Co. picks 30-acre site in Long Beach for construction of 212,000 sq. ft. building to house its Grayson Controls division, now located in Lynwood. New plant, designed by Quinton Engineers, Ltd., will be ready for occupancy by June 1954. Company manufactures thermostatic devices.

PAINT THE TOWN — Max Factor & Co. purchases eight acres in El Segundo for construction of cosmetic plant which will centralize all manufacturing and sales operations. Structure will have 250,000 sq. ft. area and cost an estimated $1,500,000.

BUILD PAPER PLANT—National Cash Register Co. begins construction of new paper plant on 10-acre site in Fullerton.

RCA PICKS VAN NUYS—RCA Victor division of Radio Corp. of America plans early construction of new plant on 45-acre site along Southern Pacific railroad in Van Nuys. Plant will serve as West Coast distributor of electronics components and tubes and radio batteries.

SUBSIDIARIES MERGE — Synthetic Rubber Products Co., Los Angeles, subsidiary of Parker Appliance Co. of Cleveland, merges with Parker's rubber products division. Facility is now known as Rubber Products Division, Parker Appliance Co.

NEW APPLIANCE PLANT — General Controls Co. begins building new plant in Burbank, across city line from main plant in Glendale. Structure has roofed area of 120,000 sq. ft. on four and one-half acre site and will be completed in late summer. It will be used primarily for operations of Grayson-Greenamyer appliance controls division of company.

WILL DOUBLE OUTPUT—Hobbs Battery Co., Oakland, undertakes program to expand production in Los Angeles, from 600 to 1,500 batteries daily, through construction of new plant. Located on one and one-half acre site, with 25,600 sq. ft. of floor space, $250,000 plant is expected to be in operation by October 1, employing about 60 men. Hobbs will then sell present Los Angeles quarters.

ANOTHER RHEEM PURCHASE — Rheem Manufacturing Co. acquires machinery, equipment and patents for manufacture of fibre shipping containers from Pacific Steel-Fiber Drums, Inc., and Pacific All-Fiber Drums, Inc. Land and buildings of two companies at Alhambra and Berkeley are not included in sale but will be used for other purposes by W. E. Hall Co., parent firm. Equipment will be installed in present Rheem plants for decentralized production of fibre containers in sizes from one to 55 gal.

ACQUIRE ONE-THIRD INTEREST — Minute Maid Corp. buys one-third stock interest in Golden Citrus Juices Inc., Fullerton, food packer. Remaining two-thirds of stock are owned by Eadington Fruit Co. and American Fruit Growers, Inc., Los Angeles.

BUY CANDY FIRM — J. W. Robinson Co., Los Angeles, acquires outstanding capital stock of Welch's Candy, Ltd., Los Angeles, and will operate firm as a subsidiary.

RICE PROCESSING PLANT—Rosenberg Bros. & Co. plan to install rice dryers, tempering and storage bins at a loca-

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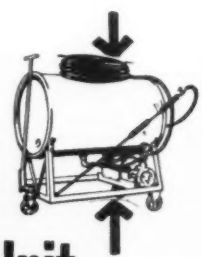

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tion five mi. southwest of Stockton in time for this year's harvest, which starts in October. Facilities will occupy seven-acre site and cost $500,000. Concrete storage bins to be built will have capacity of over 200,000 one hundred-lb. bags of rice. Rosenberg Bros., processors and distributors of dried fruits, nuts and rice, have rice milling operations at Biggs, in Sacramento Valley.

TRANSPORTS FOR GERMANY—Lockheed Aircraft Corp., Burbank, contracts to build and sell undisclosed number of Super-Constellation transports, for delivery in spring of 1955, to Luftag, new West German airline now being organized. Consolidated Vultee Aircraft Corp., San Diego, also enters into an agreement with Luftag to supply Convair-Liner 340 transports to airline, starting in April 1954. German airline will not begin operations until enabling treaties are ratified.

TRUCK-RAIL TERMINAL—San Diego Forwarding Co., San Diego, moves into new truck-rail terminal. All terminal activities are now centered in one building, which provides 14 truck bays.

MORRO ROCK STEAM PLANT—Construction starts on 400,000-hp. electric steam plant near Morro Rock in Morro Bay, being built by Bechtel Co. for Pacific Gas and Electric Co. Over 1,000 men will be required at peak of construction. Completion is expected in 1955.

TRI-STATE GROWS—Tri-State Supply Corp., Los Angeles, occupy new 6,800-sq. ft. office-warehouse building adjacent to its present warehouse. Tri-State is distributor for industrial maintenance and repair and electrical manufacturing industries.

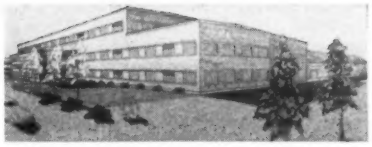
START FULL-SCALE PRODUCTION—Apex Smelting Co., Long Beach, begins production in new aluminum smelting plant, which will supply ingots to foundry, diecasting and steel industries. H. K. Ferguson Co., Los Angeles, designed and constructed plant, made up of a 180 x 300-ft. manufacturing building containing 40 x 105-ft. office and lab. facilities, and a 40 x 80-ft. administration building. Apex headquarters are in Chicago.

COLORADO

DENVER HQ. MOVE—U. S. Rubber Co.'s Denver branch office and warehouse move to new 84,000-sq. ft. building on Colorado Blvd. New headquarters will employ 67 persons.

ROASTER—Vanadium Corp. of America obtains approval from Atomic Energy Commission to install roaster at its Naturita mill, for processing vanadium-uranium ores mined on its own properties and bought from independent producers. Vanadium also exercises option to buy Durango vanadium-uranium mill which it has operated for past five years under lease from AEC.

FPC APPROVES EXPANSION — Federal Power Commission gives approval to $20,000,000 construction program of Colorado Interstate Gas Co. Daily sales capacity of utility will be increased by 82,500,000 cu. ft., to a total of 508,800,000 cu. ft.



GREAT WESTERN PLANT — New monosodium glutamate plant of Great Western Sugar Co., adjoining company's molasses refinery at Johnstown, Colo., will cost over $2,500,000 and employ about 135 people throughout year.

STOCK SALE — One-third interest in International Manufacturing Co., Denver, is purchased by Oliver Ellingson and H. P. E. Skoglund, Minneapolis, and P. J. Sundberg of St. Paul. Vernon C. Hines, president of firm, and Ralph H. Ennis, executive vice president and treasurer, retain two-thirds interest. International produces industrial and commercial combustion and portable heating equipment.

IDAHO

HIGH BID — Western Fertilizer Assn., Salt Lake City, offers high bids totaling $24,272 for lease of 200 acres of government-owned land about 15 mi. northeast of Soda Springs, Idaho. Association, representing ten large cooperative

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groups in West, plans construction of triple super-phosphate plant utilizing ore in Dry Ridge area, and already holds 1,500-acre lease which is now being explored. Plant site has not been decided, although group has purchased suitable land in Soda Springs.

CENTRAL EUREKA ADDS GEM — Central Eureka Corp., Calif. gold-mining company now carrying out diversification program, buys Gem State Meat Packing Co. of Boise, Idaho. Plant has capacity of 800 head of cattle, or 4,000 to 5,000 lambs, per week; monthly volume of business is about $600,000. Brand name becomes "Eureka—Idaho's Finest." Special trucking service to West Coast is under lease. Central Eureka's other meat operations include jobbing division, feed lots and milling plant in San Jose and boning and freezing plant in Santa Clara, Calif.

MONTANA

ANACONDA AWARDS CONTRACT—Foley Bros., Pleasantville, N. Y., are awarded construction contract for aluminum reduction plant of Anaconda Aluminum Co. at Columbia Falls. Contract is on fixed-fee basis.

REFINERY EXPANSION — Carter Oil Co. installs polymerization unit at its Billings plant to increase high-octane gasoline production by 27,000 gal. per day. Daily gasoline production will total 360,000 gal. when unit is in operation. Refinery processes 21,000 bbl. of crude oil daily.

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PHOSPHATE FIND — Preliminary report on phosphate survey in Western states carried out by Geological Survey, with Atomic Energy Commission and Bureau of Reclamation, announces promising deposit of phosphate in Centennial range, along Montana-Idaho state line. Large reserves averaging four to six ft. in thickness may contain 50,000,000 tons or more of phosphate.

NEVADA

AIR BASE HOUSING—A $3,800,000 contract for construction of 400 dwelling units at Nellis Air Force base near Las Vegas is awarded to George M. Holstein and Sons, Las Vegas. Project will begin in mid-September, with completion scheduled for December.

MAGNESIUM PLANT BURNS — Rod mill and flotation plant of Manganese, Inc., Las Vegas, are destroyed by fire, with damage estimated at several hundred thousand dollars. Plant, located five mi. east of Henderson, will be reconstructed as soon as building specifications are prepared.

WORLD'S FIRST—Converted magnesium plant at Henderson begins full operations on quantity production of titanium, with annual capacity of 3,600 tons and employing 600 persons at start. Ore used is supplied from Australia. Ingots weighing 1,200 to 2,000 lb. will be shipped to eastern mills. Original magnesium plant was built by government during World War II at cost of $240,000 and converted by H. K. Ferguson Co. at a cost reported as high as $20,000,000.

NEW MEXICO

LAND CHANGES HANDS—Hoffmantown Shopping Center Corp. is formed to handle $500,000 purchase of two-block area at Wyoming and Menaul Blvds., Albuquerque. Center, which includes 22 businesses, was completed in early 1951 by F. & S. Construction Co.

FIRST CEMENT PLANT — Universal Atlas Cement Co. of New York surveys market demand and source of materials in New Mexico before deciding whether to build cement plant, which would be state's first. Valencia County is reportedly favored because of mineral deposits.

OREGON

GET GO-AHEAD—Government agrees to modification of sale contract with Harvey Machine Co., Torrance, Calif., to permit transfer of federally constructed alumina-from-clay plant at Salem after two years of research operations instead of five. Cost of plant reportedly was $325,000. Pilot plant is proposed at cost of $35,000.

NEW FIRM BUILDING—New plywood plant will be built for Grants Pass Plywood Inc. at Grants Pass, on 14-acre site formerly occupied by Southwest Oregon Lumber Co.'s remanufacturing plant. Plant will employ 100 men at start and will be supplied veneer from Del Norte Veneer Co. peeler plant, Crescent City, Calif., recently purchased by this new firm. President and general manager of Grants Pass is F. A. Johnson, formerly general manager of Multnomah Plywood Corp., Portland.

SEAWEED SOAP—Soil Renewal Products Co., Portland, builds plant at Depoe Bay, in Lincoln County, and lease seaweed beds from state, to be used in production of soap and shampoos with a kelp base.

B. P. JOHN IN NEW HANDS—A pioneer furniture manufacturing concern in Pacific Northwest, B. P. John Furniture Corp. of Portland, is in new hands, as result of retirement of its founder and sale of company to Carl Nyssen and Robert Bourdon of Tacoma. Nyssen was executive vice president and general manager of Northwest Chair Co., and Bourdon plant manager. Former becomes president of B. P. John firm and latter vice president and plant manager. New owners are restyling the line.

PLYWOOD FOR CORVALLIS — Peak Plywood Corp. plans to build plant about two mi. west of Corvallis which is expected to be in operation in late fall. Plant building 80 x 400 ft. will house green peeler. Log pond covering 14 acres is already under construction. Operations at full capacity will employ two shifts of 40 men each, producing veneer from salvage logs.

PLANT MOVES—California Plating Works transfers to new location at 16th and N.W. Flanders, Portland, Ore. Company, founded in 1907, has facilities for all types of electroplating. In addition to commercial orders, it is working on defense contracts.

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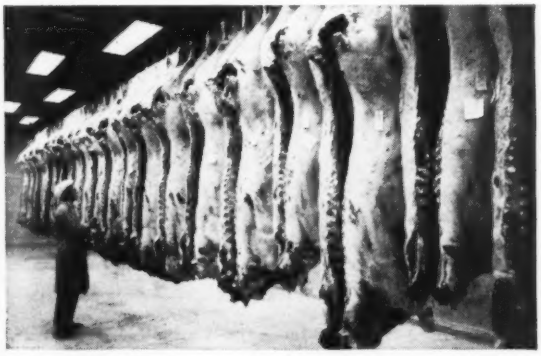

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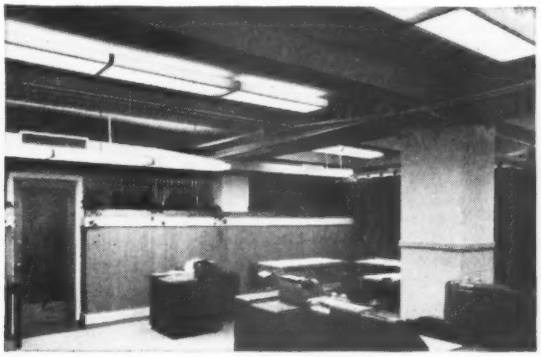

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MILL CONVERSION—M and M Wood Working Co. plans to convert its new green veneer mill at Lyons, Ore., to a complete plywood mill by Feb. 1954. Expansion, to cost about $1,500,000 will add 100,000 sq. ft. of floor space to present 44,000 sq. ft. Plywood mill will have annual capacity of 75,000,000 ft. of ⅜-in. board, and will employ about 400 people on two shifts, representing added annual payroll of $1,400,000.

WOOD PRESERVING PLANT—L. D. McFarland Co.'s new pole and wood preserving plant, located about four mi. north of Eugene, begins operations. Douglas fir and Western red cedar poles up to 90 ft. long will be processed, using as preservative pentachlorophenol in petroleum oil.

SHARPENING UP—Hanchett Manufacturing Co. plans expansion of its Pacific Coast branch in Portland through construction of 12,000-sq. ft. building now under way. Company, producer of saw sharpeners and knife grinders used in lumber and sawmill industry, has headquarters in Big Rapids, Mich.

NEW EQUIPMENT FOR NEW PRODUCT—Crown Zellerbach buys Swenson spray drier and related equipment for installation at its Lebanon mill, to be used in production of Orzan, new sulfite liquor product. Material has previously been produced in form of liquor evaporated to 45% solids, and as a spray-dried solid on a pilot plant scale. New equipment will permit 30-ton output per day. Orzan has been successfully used as constituent in industrial adhesives and binders and as a dispersant or reagent in manufacturing processes.

BUY LUMBER MILL—Valsetz Lumber Co. of Portland and Valsetz, Ore., acquires Western Pine Manufacturing Co. plant, Spokane, from stockholders. Property includes mill with annual capacity of 55,000,000 board ft., employing between 270 and 300 persons, and over 30 acres of land. Earlier this year Valsetz purchased assets of Lincoln Lumber Co., Lincoln, Wash., from same owners, Dixon family.

UTAH

STEAM PLANT CONTRACT — Utah Power and Light Co. awards contract for construction of $10,500,000 steam electric plant at Castle Gate, east central Utah, to Bechtel Corp., San Francisco. Excavation work is now under way by Morrison-Knudsen Co., Boise, Idaho. Fuel for the 66,000-kw. plant will be supplied by conveyor belt from adjoining Independent Coal & Coke Co. mine. Water for plant will be transported by Price River. Plant will draw from river an amount equal to water pumped into it from wells near Colton, about 13 mi. north. Plant is scheduled for completion by end of 1954.

ORGANIZE TUNGSTEN FIRM — Salt Lake Tungsten Co. is formed by Minerals Engineering Co. and Sylvania Electric Products Corp. to operate refinery now under construction in Salt Lake City. Refinery will produce about 200,000 lb. of tungsten monthly when operations begin in August. Minerals Engineering Co. now has tungsten concentrator under construction at Glenn, Mont., where firm mines tungsten. Salt Lake refinery will also process concentrates supplied by H. M. and S. Milling Co., mined from Intermountain area.

INCREASE PIPELINE CAPACITY — Salt Lake Pipe Line Co. will construct additional facilities at a cost of $1,700,000 to raise capacity of its petroleum pipeline from Salt Lake to Pasco, Wash., by 20%. Upon completion, line will have 42,500 bbl. per day capacity from Salt Lake City to Boise and 22,500 bbl. per day from Boise to Pasco. Increase will be accomplished by installing new pumps, laying 40 mi. of new line between Adams, Ore., and Pasco, and building five 12,500-bbl. tanks at Boise, Idaho.

AMMONIA PLANT — Anhydrous ammonia plant, to cost about $9,000,000, will be built in Salt Lake City area by newly formed Mill Creek Chemical Co. Daily capacity planned is 180 tons of anhydrous ammonia, used in chemical fertilizers and other products, and 30 tons of dry ice. Tears Engineers and Henry C. Beck Co., both of Dallas, are in charge of construction. Plant will be in operation by spring 1955.

CO_2 WELL—Equity Oil Co., Salt Lake City, completes carbon dioxide well in Carbon County and negotiates for sale of gas to Carbon Dioxide and Chemical Co., which has three wells in vicinity and ships by pipeline to reduction plant at Wellington.

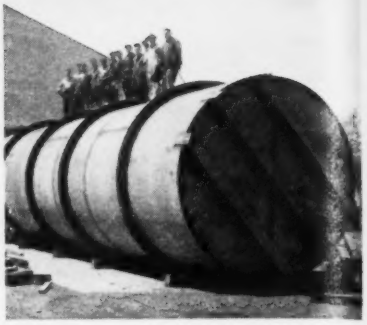
WASHINGTON

ALTER PLAN—Pacific Northwest Alloys, Inc., Mead, changes plans, previously stated to be complete conversion to ferrochrome production, and continues ferrosilicon production from two electric furnaces.

NEW RAILROAD YARDS—Union Pacific Railroad plans construction of new yards in East Spokane. West Spokane yards will be abandoned and dismantled when new yards go into operation, probably in late fall. Construction of buildings will continue into next year.

TACOMA INDUSTRIAL COUNCIL—New group in Tacoma, incorporated independent of Chamber of Commerce but affiliated with it, will work to promote industrial growth of area through ten-point action program, which includes assisting in new product development, financing of new industries, research and industrial surveys.

POSSIBLE NEW PLANT—Undisclosed steel manufacturer begins discussions with Tacoma city officials on availability of land in South Tacoma for siting fabricating plant.



NEW FACTORY FOR METAL FABRICATOR—Welk Brothers Metal Products, Spokane, moves to new 11,000-sq. ft. plant specially equipped for production flexibility. Company produces 5-gal. to 50,000-gal. oil storage tanks, iron railings for home and industrial building, and defense orders. Picture shows Welk Brothers' welding crew standing on one of five 65-ft.-long, 13-ft.-diameter jet fuel storage tanks manufactured for the Air Force.

ANACORTES SITE—Shell Oil Co. picks Anacortes, on Puget Sound 80 mi. north of Seattle, as site of $75,000,000 refinery. Plant will employ about 1,500 men and process about 50,000 bbl. of oil daily. Supplier of crude oil will be Trans-Mountain Oil Pipe Line Co., which expects to complete this year an $85,000,000 pipe line from Alberta to British Columbia. Process design and negotiations with contractors for new plant are now in progress.

KAISER GYPSUM PLANT — Kaiser Gypsum Co., Inc., Seattle, orders plans for construction of $4,000,000 gypsum board plant and plaster mill. Site will be 9½-acre tract with access to Duwamish Waterway purchased by company two years ago for about $100,000. Plant, to have five main buildings and employ 170 direct employees, will produce complete line of gypsum building materials, with production capacity of 100,000,000 sq. ft. annually. It is scheduled to be in operation by December 1954.

RECOVER CRYOLITE—Reynolds Metals Co., Longview, is reclaiming cryolite from plant fumes and carbon linings of its aluminum reduction potlines in sufficient quantity to supply reduction operations. Kaiser Aluminum and Chemical Corp. also uses this process at its Mead aluminum reduction plant.

WYOMING

SULPHUR PLANT—Jefferson Lake Sulphur Co. negotiates with natural gas producers in Worland area preliminary to planning sulfur extracting plant. Plant to be constructed will have daily capacity, at first, of 100 tons and ultimately 300 tons.

IN FULL OPERATION—Food Machinery and Chemical Corp.'s soda ash plant at Westvaco reaches commercial production levels and begins regular shipment of soda ash. Test operations at the $20,000,000 plant began in mid-April. Mine is operating full force and plant now employs 417 men. FMC's Westvaco chemical division operates plant for Intermountain Chemical Co. and acts as exclusive sales agent.

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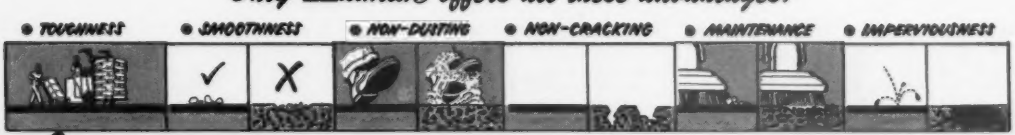

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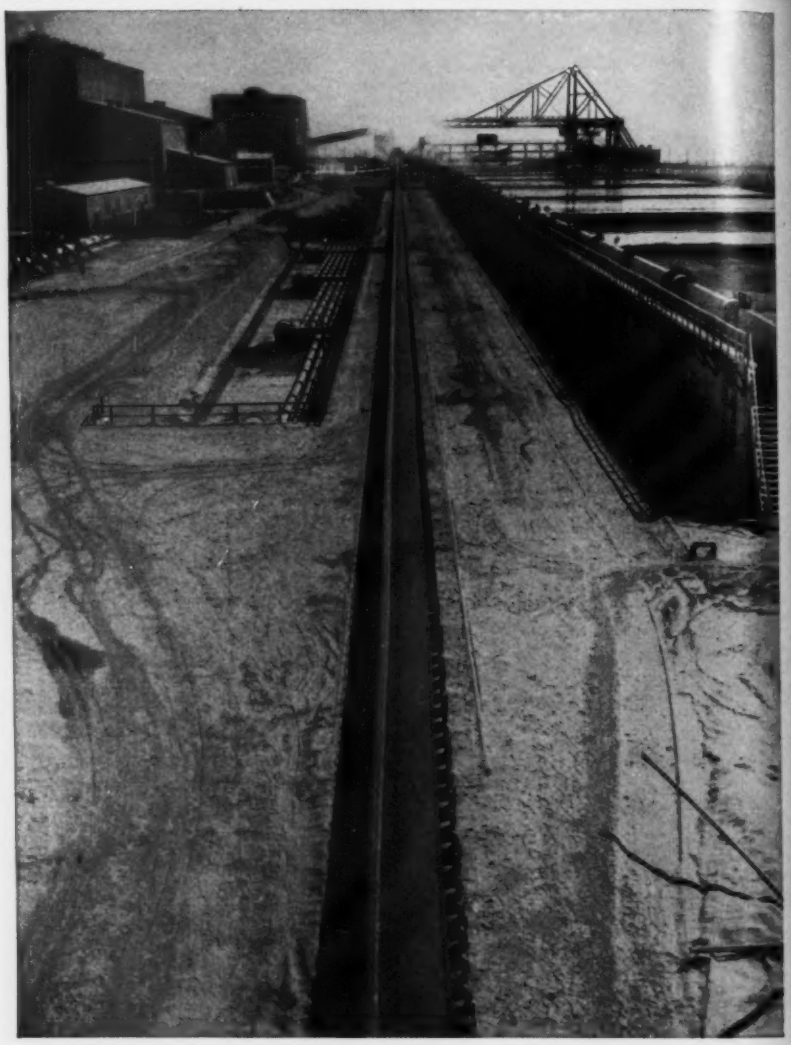

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